

# **Ozone Redesignation Request And Maintenance Plan For the Denver Metropolitan Area**

**Approved by:**

**Colorado Air Quality Control Commission  
January 11, 2001**



**Colorado Department  
of Public Health  
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## APPENDICES

**Appendix A: Emissions Inventories**

**Appendix B: Changes to AQCC Ambient Air Quality Standards Regulation**

Chapter 1, *Introduction*, is provided as background information only and is not to be construed to be part of the federally-enforceable State Implementation Plan.

Chapter 2, *Requirements for Redesignation*, is the State's request to the U.S. Environmental Protection Agency (EPA) to redesignate the Denver area to attainment for the one-hour ozone standard.

Chapter 3, *Maintenance Plan*, is being submitted for inclusion in the federally-enforceable State Implementation Plan and provides for maintenance of the one-hour ozone standard through the year 2013.

## **CHAPTER 1: INTRODUCTION**

The State of Colorado, in coordination with the Regional Air Quality Council (RAQC), is requesting that the U.S. Environmental Protection Agency (EPA) redesignate the Denver metropolitan nonattainment area to attainment status for the 1-hour Ozone National Ambient Air Quality Standard. From 1978 through June 1998 the Denver metropolitan area had been designated as an ozone nonattainment area, but has not violated this 1-hour ozone standard since 1987.

A redesignation request and maintenance plan was originally submitted in August 1996. However, in early 1997, during the EPA review period, a legal question was raised by EPA regarding statutory “sunset” provisions for the plan and the I/M program. Also, a new 8-hour standard was promulgated by EPA in July, 1997. The 1-hour standard was revoked for Denver in June, 1998 rendering the original submittal moot at that time. Due to legal problems with implementing the 8-hour standard, the EPA promulgated reinstatement of the 1-hour ozone standard on July 20, 2000. Since in this interim period the region has not violated the 1-hour standard, the region is still eligible for redesignation. The original maintenance plan has been revised to address the original questions raised by the EPA and to update the technical analysis and provide for a 10 year maintenance demonstration.

### **Regional Air Quality Council**

The Regional Air Quality Council is designated by Governor Owens as the lead air quality planning agency for the Denver metropolitan area. In this capacity, the mission of the RAQC is to develop effective and cost-efficient air quality initiatives with input from state and local government, the private sector, stakeholder groups, and private citizens. The RAQC's primary task is to prepare state implementation plans (SIPs) for compliance with federal air quality standards. The RAQC consists of a nine-member board appointed by the Governor. The board is comprised of local government, state agency, and citizen representatives.

### **Colorado Air Quality Control Commission**

The Colorado Air Quality Control Commission (AQCC) is a regulatory body with responsibility for adopting air quality regulations consistent with State statute. This includes the responsibility and authority to adopt State Implementation Plans (SIPs) and their implementing regulations. The Commission takes action on SIPs and regulations through a public rule-making process. The Commission has nine members who are appointed by the Governor and confirmed by the State Senate.

## **A. National Ambient Air Quality Standards for Ozone**

In 1971 the EPA set National Ambient Air Quality Standards (NAAQS) for several air pollutants, including photochemical oxidants. In 1979, the EPA changed the photochemical oxidant standard to a national ozone standard of 0.12 parts per million of ozone in ambient air, based on a one-hour averaging time for the measurement. This is usually shortened to 0.12 parts per million, or 0.12 ppm. In 1997 the EPA promulgated an 8-hour national ozone standard, and in 1998 revoked the 1-hour national ozone standard for Denver. Because of legal problems impacting implementation of the 8-hour standard, the EPA has promulgated reinstatement of the national 1-hour ozone standard of 0.12 ppm.

There are both primary and secondary air quality standards. The primary standards are set to protect human health, with a margin of safety to protect the more sensitive persons in the population, such as the very young, elderly and the ill. Secondary standards are set to protect property, materials, aesthetic values and general welfare. For ozone the national primary and secondary standards are the same. The numerical levels of the standards are subject to change, based on new scientific evidence summarized in air quality criteria documents. As discussed above the EPA has attempted to revise the standard, but is currently involved in a federal lawsuit over implementation of the new 8-hour standard.

The formal statement of the ozone NAAQS appears in the Code of Federal Regulations (CFR Part 50.9), which says:

*The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 parts per million is equal to or less than one, as determined in Appendix H.*

Appendix H to Part 50 provides an interpretation of the standard and a procedure for estimating the number of exceedances per year. Other EPA guidance documents provide detailed procedures for evaluating air monitoring data and determining attainment of the national standard.

In general demonstrating attainment requires collecting representative air monitoring data using EPA approved reference or equivalent methods and procedures meeting 40 CFR 58, Appendix A, Quality Assurance Requirements. The three most recent years are examined. All locations within an area have to meet the standard, so a determination is made at each monitoring site. Attainment is achieved when the average annual number of expected exceedances is less than or equal to one. In practice, no monitor can have more than three days with exceedances of 0.125 ppm during the three most recent calendar years. Air quality measurements in the Denver Metro nonattainment area satisfy this requirement, as shown in Chapter 2.B.: Attainment of the One-Hour NAAQS.

## **B. Health and Welfare Effects of Ozone**

Ozone is a reactive chemical compound - a molecule consisting of three oxygen atoms with the chemical symbol O<sub>3</sub>, which is formed by a photochemical reaction between Volatile Organic Compounds (VOC) and Nitrogen Oxides (NO<sub>x</sub>) in the presence of sunlight and is usually associated with elevated ambient temperatures. Ozone is a strong oxidizing agent with potential

to damage living or inanimate things with which it comes in contact. When present in the lower atmosphere, even at low concentrations, ozone is harmful to human health and to property. The most common human health effects are breathing impairment. These are thought to be reversible acute effects, but there is some emerging evidence of chronic effects from long term exposure. Ozone damages trees and other natural vegetation, reduces agricultural productivity, and cause or accelerates deterioration of building materials, surface coatings, rubber, plastic products and textiles.

### **C. Denver Ozone Area Designation History**

On March 3, 1978 the EPA designated the Denver Metro Area as nonattainment for the Ozone NAAQS (43 FR 8976). This designation was reaffirmed by EPA on November 6, 1991 (56 FR 56694) pursuant to section 107(d)(1) of the Clean Air Act, as amended in 1990. The Denver Metro Nonattainment Area had not shown a violation of the ozone standard during the three year period from January 1, 1987 to December 31, 1989, and therefore was classified as a "transitional" ozone nonattainment area under section 185A of the amended Act.

On June 5, 1998, the EPA revoked the 1-hour ozone standard for the Denver metro area. On July 20, 2000 the EPA promulgated reinstatement of the 1-hour ozone standard for the Denver metro area.

### **D. Denver Metropolitan Ozone Nonattainment Area**

The Denver Metro area ozone nonattainment and attainment maintenance boundaries are defined by the Air Quality Control Commission as follows:

*All of Denver, Jefferson, and Douglas Counties; Boulder County (excluding Rocky Mountain National Park) and the Automobile Inspection and Readjustment Program portions of Adams and Arapaho Counties.*

A map describing the nonattainment and attainment maintenance area boundaries is included in Chapter 2, Figure 2-1.

### **E. Required Components of a Redesignation Request**

Sections 107(d)(3)(d) and (e) of the Clean Air Act define the criteria an area must meet before being redesignated to attainment/maintenance status. With the submittal of this Maintenance Plan, the Denver metropolitan area meets all of these criteria.

#### **1. Attainment of the standard**

The State must show that the area has attained the national standards for ozone.

**2. State Implementation Plan approval**

The area must have a fully approved Ozone State Implementation Plan.

**3. Improvement in air quality due to permanent and enforceable emissions reductions**

The State must demonstrate that the improvement in air quality leading to attainment of the standard is due to permanent and federally enforceable emissions reductions.

**4. CAA Section 110 and Part D requirements**

The State must meet all requirements of Section 110 and Part D of the CAA. Section 110 describes general requirements for SIPs, while Part D pertains to general requirements applicable to all nonattainment areas.

**5. Maintenance Plan**

The area must have a fully approved Ozone Maintenance Plan that meets the requirements of CAA Section 175a, including a demonstration that the area will maintain the standard for a period of at least 10 years following redesignation by EPA. The plan must also contain contingency measures that could be implemented if a violation of the standard is monitored at any time during the maintenance period.



## **CHAPTER 2: REQUIREMENTS FOR REDESIGNATION**

The State of Colorado, in coordination with the Regional Air Quality Council (RAQC), requests that the U.S. Environmental Protection Agency (EPA) redesignate the Denver metropolitan nonattainment area to attainment status for the one-hour ozone National Ambient Air Quality Standards (NAAQS). The Denver metropolitan area has been designated as an ozone nonattainment area since the 1970's, but has not violated the standard since 1987. Therefore, the area is now eligible for redesignation.

### **A. Required Components of a Redesignation Request**

Sections 107(d)(3)(D) and (E) of the CAA define the following five required components of a redesignation request.

- ◆ **Attainment of the One-Hour Ozone NAAQS**
- ◆ **State Implementation Plan Approval**
- ◆ **Improvement in Air Quality Due to Permanent and Enforceable Emissions Reductions**
- ◆ **CAA Section 110 and Part D Requirements**
- ◆ **Maintenance Plan**

The first four requirements are addressed below in this chapter. The fifth requirement, the Maintenance Plan, is addressed in Chapter 3.

### **B. Attainment of the One-Hour Ozone NAAQS**

Attainment of the one-hour ozone NAAQS, which is 0.12 parts per million (ppm) of ozone in ambient air (based on a one-hour averaging time for the measurement) is demonstrated when the average annual number of expected exceedances is less than or equal to one. In practice, no monitor can have more than three days with exceedances of 0.125 ppm during the three most recent calendar years. The following information demonstrates, as required by Section 107(d)(3)(E) of the Clean Air Act, that the Denver metropolitan area has attained the national one-hour standard for ozone. Since ozone is a regional pollutant, this demonstration is based on quality assured monitoring data collected throughout the Denver area, with focus on the monitors located in the western portion of the metro area near the foothills.

## **1. Denver Area Historical Perspective**

Historically, the one-hour ozone standard had been frequently violated in the 1970's and 1980's throughout the Denver metropolitan area. There have been occasional exceedances, but no violations, in the 1990's. With the implementation of emission control programs aimed at reducing automobile and industrial emissions, ozone concentrations have stabilized at levels below the NAAQS. Although there have been sporadic exceedances recorded by the extensive network of monitors, the area has not shown a violation of the NAAQS since the three-year January 1, 1986 to December 31, 1988 period.

## **2. Ozone Monitoring Network**

The current ozone ambient air monitoring network in the Denver area consists of nine stations operated by the Colorado Air Pollution Control Division, though there have been other stations that have operated in the past. The geographical distribution of the monitors is presented in Figure 2-1.

This section shall not be construed to establish a monitoring network in the federally-enforceable SIP. EPA has already approved a monitoring SIP for the State of Colorado and this description of the ozone monitoring network shall not be construed to amend such monitoring SIP.

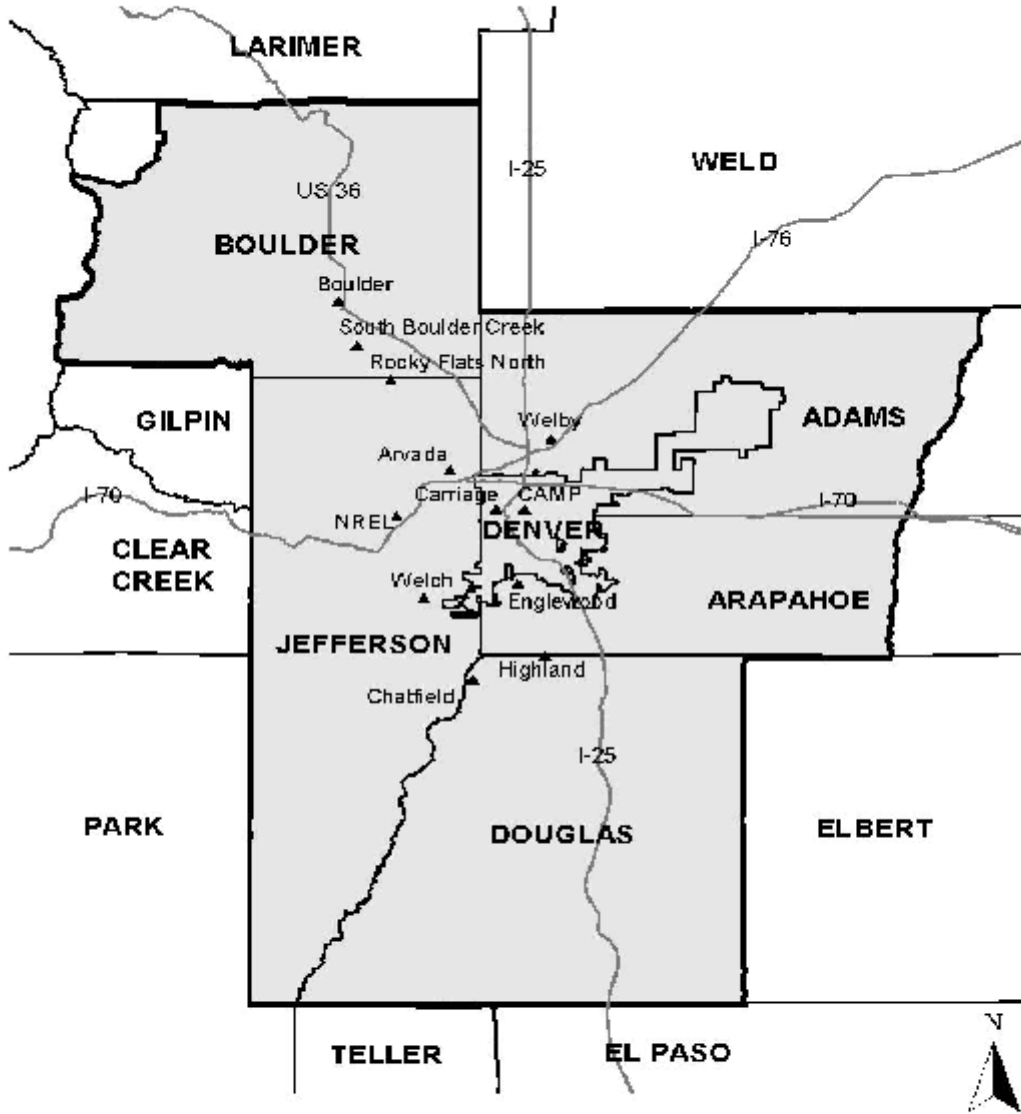
## **3. Monitoring Results and Attainment Demonstration**

The ozone NAAQS requires that the average annual number of expected exceedances, according to 40 CFR 50.9, is less than or equal to one over a three year period. An exceedance is described as any maximum hourly average concentration greater than 0.12 ppm. Due to rounding conventions, an exceedance requires a concentration of 0.125 ppm or greater. The term "expected number of exceedances" is used because the standard attempts to account for missing sampling days. This mathematical estimate of missing sampling days will increase the "expected number of exceedances" by a fractional amount. The monitoring data presented in Table 2-1 verify that the Denver area is attaining the one-hour ozone NAAQS. Since 1990, the three-year average of expected values greater than 0.125 ppm is less than or equal to one. Summary data from 1985 through 1999 is shown in the graphs in Figure 2-2. Data for the 2000 season is summarized in Table 2-2.

## **4. Quality Assurance Program**

Ozone monitoring data for the Denver area have been collected and quality-assured in accordance with 40 CFR, Part 58, Appendix A, EPA's "Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. 11; Ambient Air Specific Methods", the APCD's Standard Operating Procedures Manual, and Colorado's Monitoring SIP which EPA approved in 1993. The data are recorded in EPA's Aerometric Information Retrieval System (AIRS) and are available for public review at the APCD and through EPA's AIRS database. Table 2-3 presents the data recovery rates for each monitoring site.

**Figure 2-1.**  
**Map of the Denver Metropolitan Ozone**  
**Attainment/Maintenance Area and Monitoring Sites**



**Table 2-1. Three-Year Average of Expected Exceedances of the One-Hour Ozone NAAQS**

Monitoring Site	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Boulder Marine St.	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
S. Boulder Creek	/	/	/	()	()	1.0	0.0	0.0	0.0	0.0	0.0
Rocky Flats North	/	/	()	()	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arvada	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carriage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
NREL	/	/	/	()	()	0.3	0.3	0.3	0.0	0.0	0.0
Englewood	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
Welch	()	()	()	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Highland	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chatfield	/	/	/	/	/	()	()	0.0	0.4	0.4	0.4

- the monitoring site is no longer operating
- / the monitoring site had not been established
- () the 3-year average of expected exceedances could not yet be determined

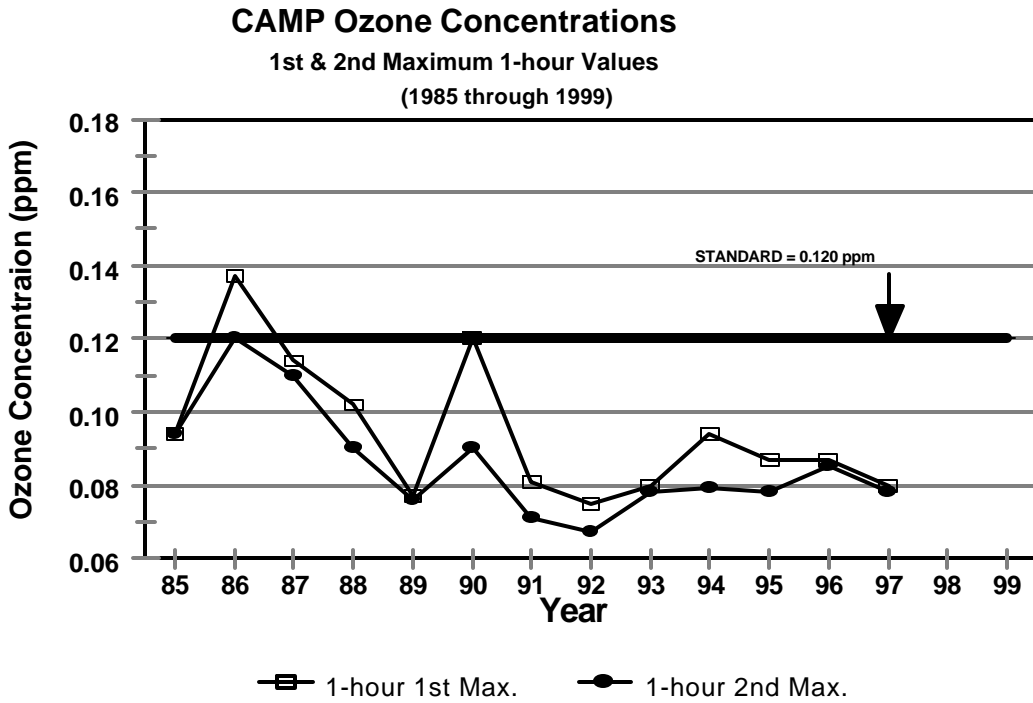
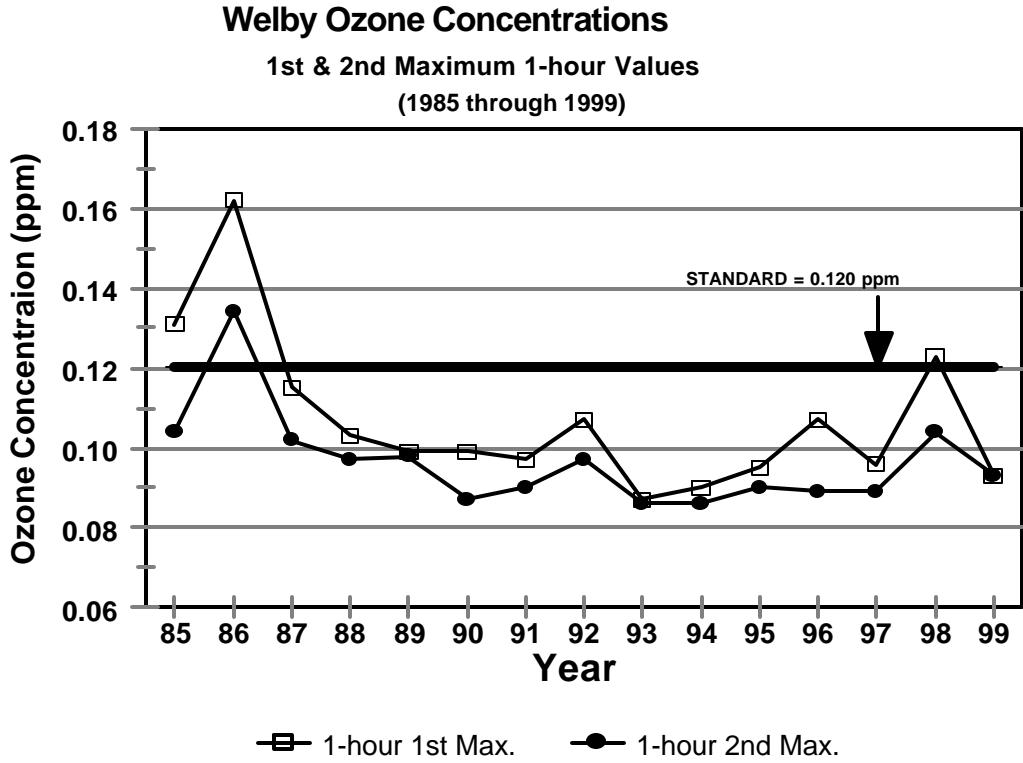
**Table 2-2. 1<sup>st</sup> & 2<sup>nd</sup> Maximum 1-Hour Ozone Values (ppm) by Monitor Site (2000)**

Monitor Site	Welby	Highland	Arvada	Carriage	Chatfield
1 <sup>st</sup> Max.	.080	.111	.102	.098	.106
2 <sup>nd</sup> Max.	.076	.097	.096	.091	.104

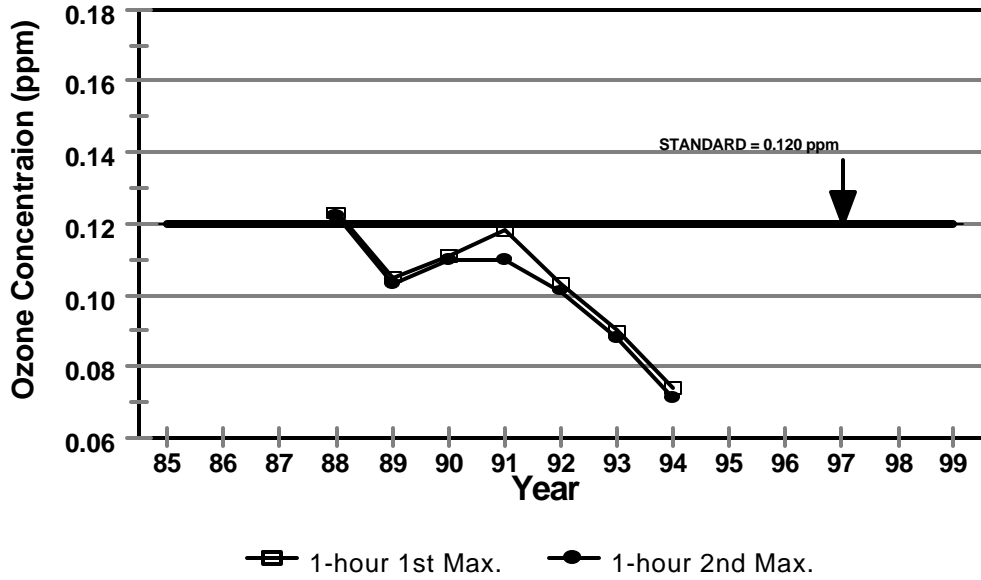
Monitor Site	NREL	S. Boulder Creek	Welch	Rocky Flats N.	-
1 <sup>st</sup> Max.	.118	.099	.098	.103	-
2 <sup>nd</sup> Max.	.107	.090	.087	.097	-

Figure 2-2.  
 Historical Monitoring Data for the One-Hour Ozone NAAQS by Monitoring Site  
 (1985-1999)



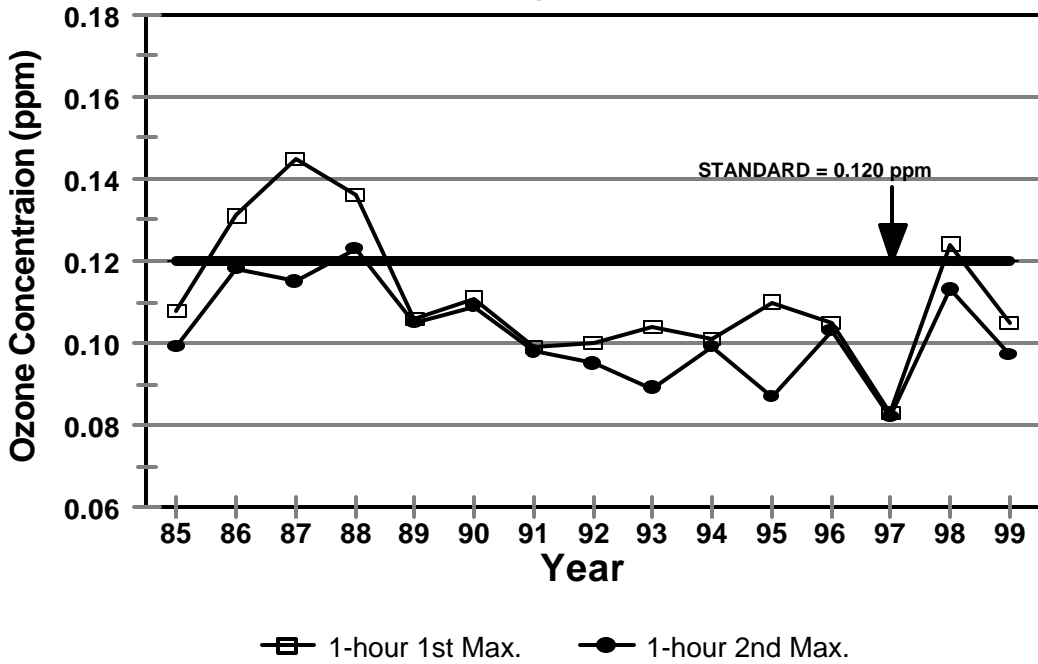
### Englewood Ozone Concentrations

1st & 2nd Maximum 1-hour Values  
(1985 through 1999)



### Highland Ozone Concentrations

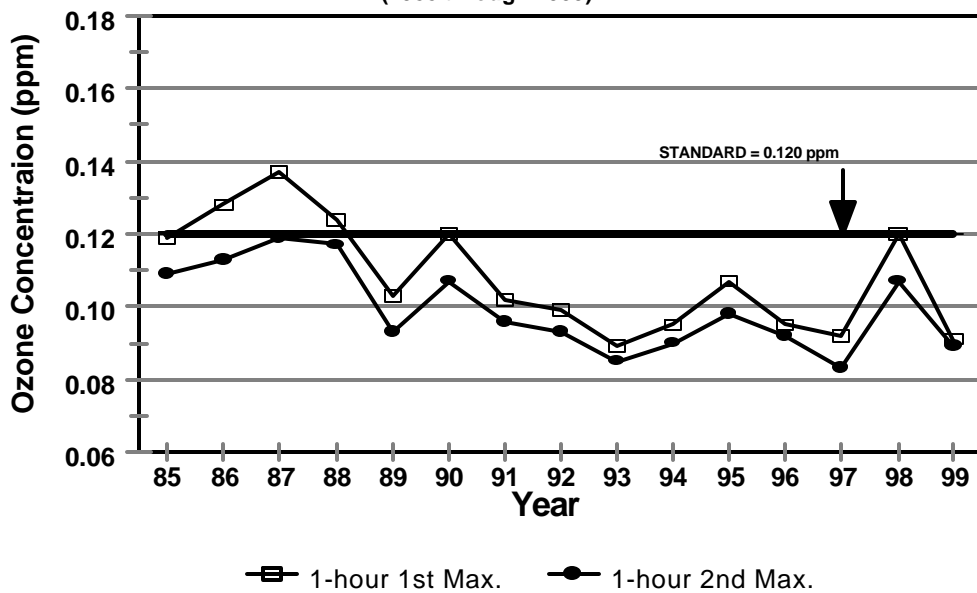
1st & 2nd Maximum 1-hour Values  
(1985 through 1999)



### Carriage Ozone Concentrations

1st & 2nd Maximum 1-hour Values

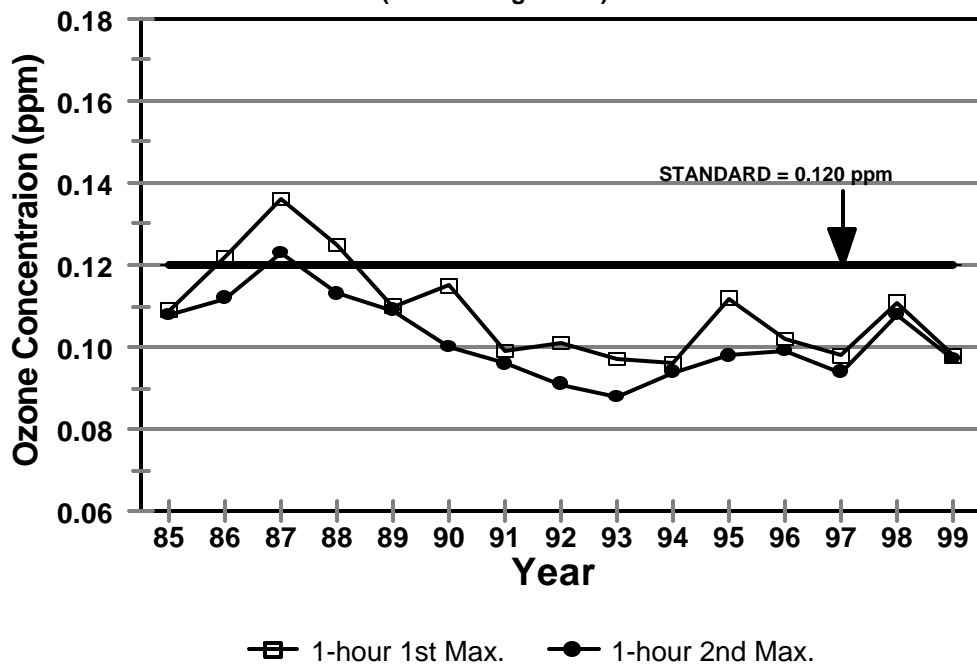
(1985 through 1999)



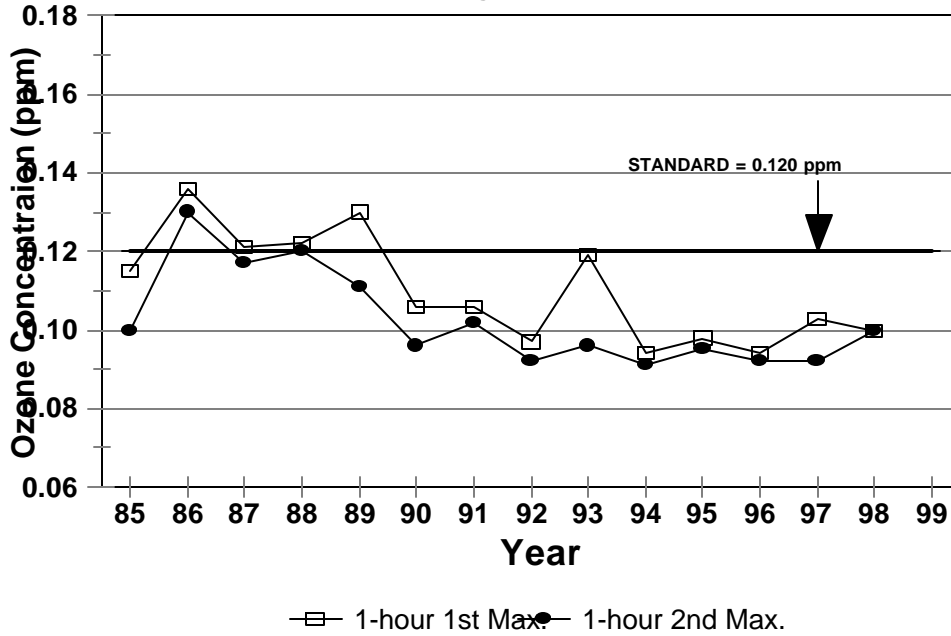
### Arvada Ozone Concentrations

1st & 2nd Maximum 1-hour Values

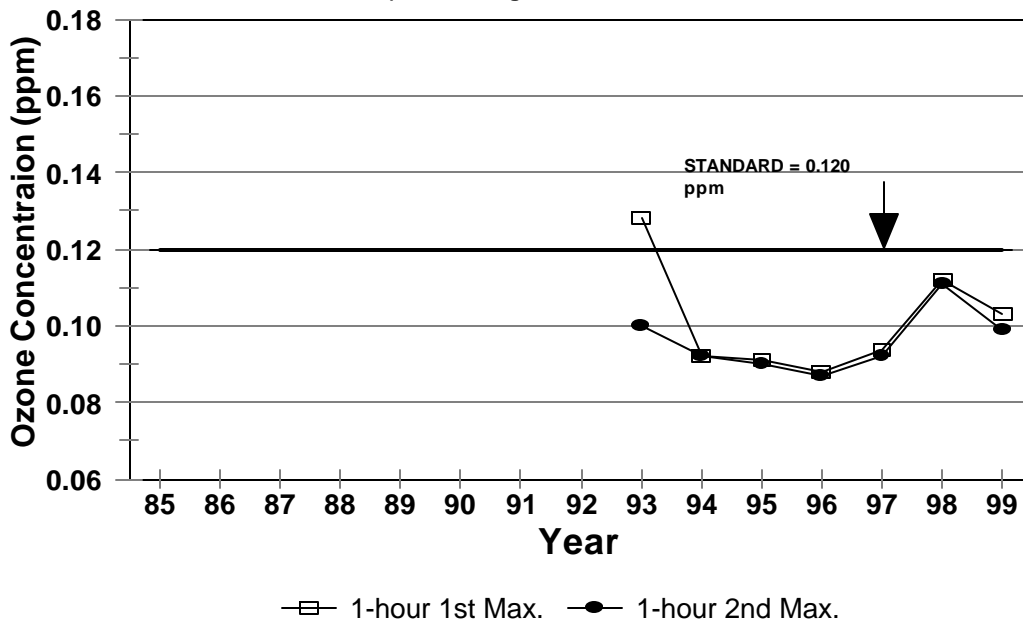
(1985 through 1999)



### Boulder Marine Ozone Concentrations 1st & 2nd Maximum 1-hour Values (1985 through 1999)



### S. Boulder Creek Ozone Concentrations 1st & 2nd Maximum 1-hour Values (1985 through 1999)

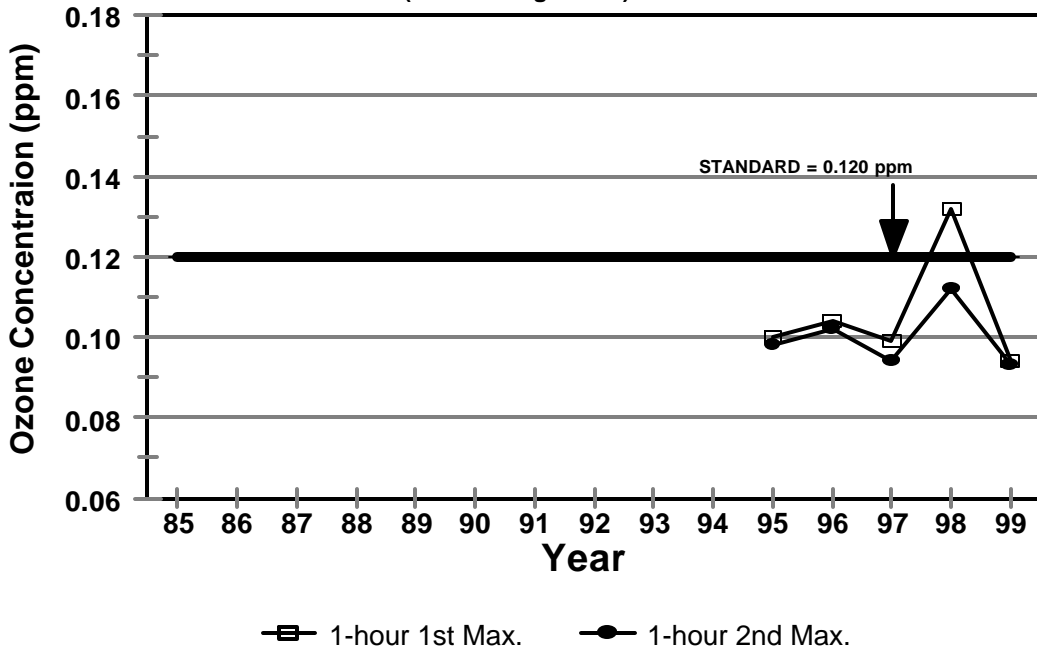




### Chatfield Ozone Concentrations

1st & 2nd Maximum 1-hour Values

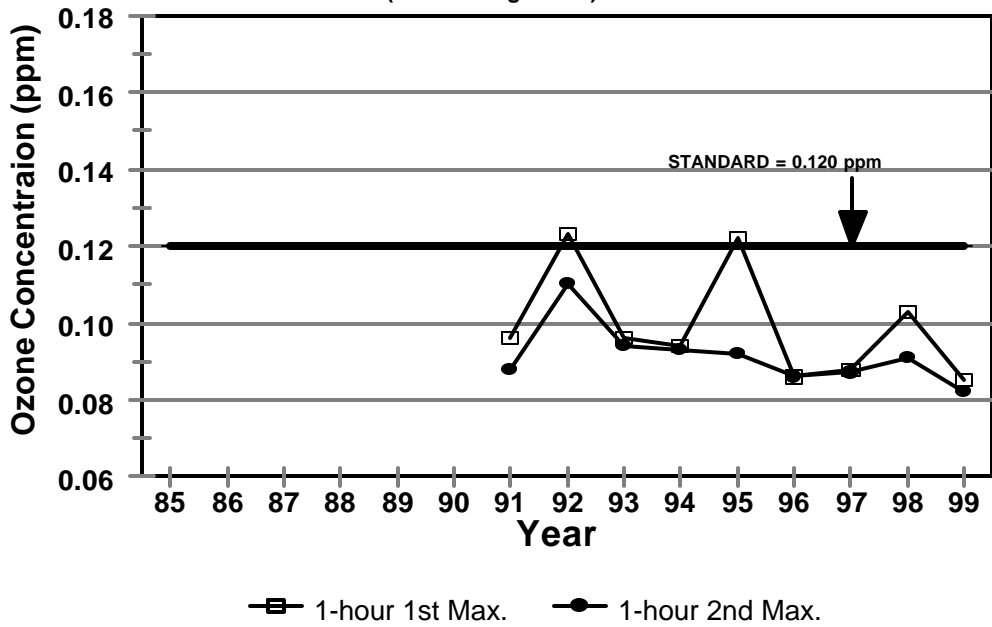
(1985 through 1999)



### Welch Ozone Concentrations

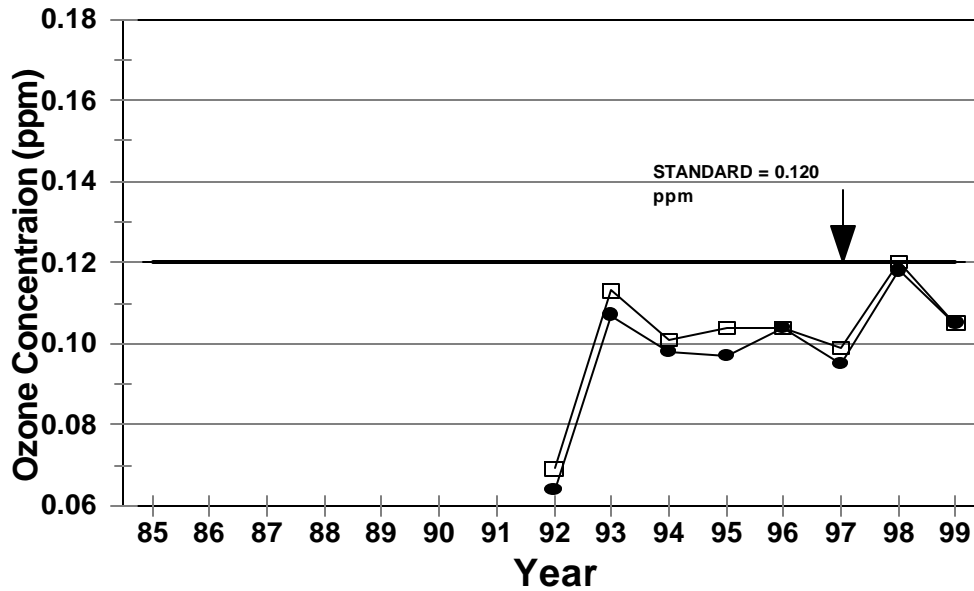
1st & 2nd Maximum 1-hour Values

(1985 through 1999)



## R. Flats North Ozone Concentrations

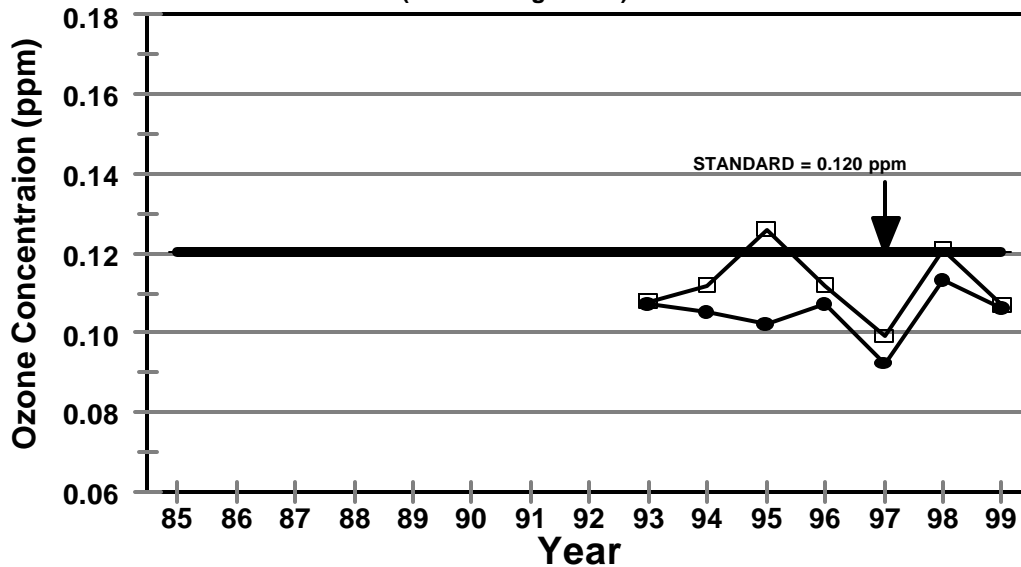
1st & 2nd Maximum 1-hour Values  
(1985 through 1999)



□ 1-hour 1st Max. ● 1-hour 2nd Max.

## NREL Ozone Concentrations

1st & 2nd Maximum 1-hour Values  
(1985 through 1999)



□ 1-hour 1st Max. ● 1-hour 2nd Max.

**Table 2-3. Ozone Data Recovery Rates for Each Monitoring Site**

Years	Welby Data Recovery	Highland Data Recovery	Englewood Data Recovery	S. Boulder Creek Data Recovery	Boulder Marine St. Data Recovery	CAMP Data Recovery
1985	93%	99%	no data	no data	99%	93%
1986	81%	95%	no data	no data	99%	97%
1987	99%	98%	no data	no data	97%	99%
1988	92%	93%	71%	no data	96%	98%
1989	99%	96%	95%	no data	86%	99%
1990	84%	78%	98%	no data	86%	97%
1991	99%	99%	91%	no data	92%	98%
1992	98%	99%	98%	no data	99%	99%
1993	92%	97%	96%	33%	99%	99%
1994	96%	95%	48%	50%	96%	99%
1995	97%	98%	no data	71%	96%	99%
1996	98%	99%	no data	76%	98%	99%
1997	86%	87%	no data	99%	96%	99%
1998	99%	99%	no data	99%	99%	no data
1999	99%	98%	no data	99%	no data	no data
2000	99%	99%	no data	98%	no data	no data

Years	Carriage Data Recovery	Chatfield Data Recovery	Arvada Data Recovery	Welch Data Recovery	R. Flats N. Data Recovery	NREL Data Recovery
1985	92%	no data	99%	no data	no data	no data
1986	100%	no data	97%	no data	no data	no data
1987	99%	no data	97%	no data	no data	no data
1988	99%	no data	98%	no data	no data	no data
1989	93%	no data	98%	no data	no data	no data
1990	84%	no data	94%	no data	no data	no data
1991	90%	no data	85%	11%	no data	no data
1992	98%	no data	93%	98%	6%	no data
1993	95%	no data	99%	86%	93%	46%
1994	98%	no data	97%	99%	99%	55%
1995	96%	75%	95%	96%	86%	99%
1996	89%	99%	99%	99%	96%	99%
1997	96%	93%	99%	86%	98%	99%
1998	98%	84%	98%	99%	97%	100%
1999	94%	72%	93%	99%	97%	63%
2000	89%	93%	98%	94%	99%	98%

Percent data recovery is the number of valid sampling days occurring within the "ozone season", divided by the total number of days encompassing the "ozone season". A valid sampling day is one in which at least 75% of the hourly maxima are recorded. The EPA specified "ozone season" is March 1 through September 30, encompassing 214 days.

## **C. Approval of the Ozone Nonattainment SIP Element for the Denver Area**

Various plans and programs to reduce volatile organic compounds (VOCs) and nitrogen oxides (NOx), which are precursor emissions that form ozone in the atmosphere, from motor vehicles and industrial facilities were adopted by the State of Colorado and the U.S. Environmental Protection Agency in the 1980's. The Colorado Ozone SIP Element was approved by EPA on December 12, 1983 (48 FR 55284). A revision to the SIP, consisting of revisions to Regulation No. 7, was approved by EPA on May 30, 1995 (60 FR 28055). The Clean Air Act Amendments of 1990 established additional federal requirements for motor vehicle and industrial sources, but no amendments to the State's SIP were required. Therefore, the Denver metropolitan area SIP Element for the one-hour ozone NAAQS is fully approved under Section 110(k) of the Act.

## **D. Improvement in Air Quality Due to Permanent and Enforceable Emission Reductions**

It is reasonable to attribute the improvement in ambient ozone concentrations in the Denver area to emission reductions which are permanent and enforceable. The Denver area has met the national standard for ozone as a result of effective State and federal emission reduction measures, as opposed to temporary or "chance" events.

A downturn in the economy is clearly not responsible for the improvement in ambient ozone levels in the Denver metropolitan area. Over the last ten years, the region has experienced strong growth while at the same time achieving a continuous attainment of the one-hour ozone NAAQS. The Colorado State Demographer's Office reports that between 1990 and 2000, job growth in the Denver area increased at an annual rate of approximately three percent, population increased by about two percent each year, and personal income increased by approximately seven percent each year. In its 1997 Vehicle Miles Traveled (VMT) forecasting and tracking report, the Colorado Department of Transportation (CDOT) estimated a VMT increase of approximately eight percent between 1995 and 2000.

The existing control measures that have brought the Denver Metro area into attainment of the one-hour ozone standard include a mix of federal tailpipe standards, and the state's vehicle inspection/maintenance program and industrial source control regulations as follows:

### **1. Federal Tailpipe Standards**

One of the more important mobile source control measures for the Denver metropolitan area and the nation is the Federal Motor Vehicle Emissions Control Program (FMVECP), established in 1968. The Clean Air Act of 1970 and its 1977 Amendments led to the advent of catalytic converters in 1975 and computerized engine control systems in 1981. The 1990 CAA Amendments required additional control measures, including stricter emission standards for cars, light duty trucks, minivans and sport/utility vehicles; and an extended warranty and recall period. Federal standards will continue to provide emission reduction benefits as older vehicles are retired and vehicles meeting the newest standards enter the fleet.

## **2. Vehicle Inspection & Maintenance Program**

Colorado's Automobile Inspection and Readjustment (AIR) Program is described in AQCC Regulation No. 11 and has been applicable in the Denver area since 1981. The AIR Program works to reduce VOC and NOx pollutants from gasoline-powered motor vehicles by requiring them to meet emission standards through periodic tailpipe tests, maintenance, and specific repairs. The AIR Program was updated in 1994 to meet the requirements of the Clean Air Act Amendments of 1990, and a more stringent and effective "enhanced" inspection program began in 1995. The enhanced program uses a loaded-mode dynamometer test called I/M 240 for 1982 and newer vehicles and an idle test for older vehicles and heavy trucks.

## **3. Industrial Source Controls**

The State's comprehensive permit rules, AQCC Regulations No. 3 and 6, control emissions from industrial facilities and limits VOC and NOx emissions from new or modified major stationary sources. The State continues to enhance its permit and control programs, while simultaneously pursuing a strong inspection and enforcement presence, as authorized by the AQCC's "Common Provisions" regulation. Additionally, the State has Regulation No. 7, "Regulation to Control Emissions of Volatile Organic Compounds", which contains reasonably available requirements for commercial and industrial sources of VOCs.

## **E. CAA Section 110 and Part D Requirements**

For the purposes of redesignation, all of the general nonattainment area requirements of CAA Section 110 and Part D must be met. In general, the requirements of Section 110(a)(2) are:

- ◆ the establishment and implementation of enforceable emission limitations;
- ◆ the monitoring, compiling, and analyzing of ambient air quality data;preconstruction reviews and permitting of new and modified major stationary sources;
- ◆ consulting with and providing for the participation of local governments that are affected by the plan;
- ◆ assurance that the State has the adequate funds and authority to enforce the SIP Element and the associated regulations; and
- ◆ permit fees for stationary sources.

Colorado Revised Statute 25-7-111 requires the APCD to administer and enforce the air quality programs adopted by the AQCC. With a staff of 150 people and a budget of approximately \$13 million, the APCD has committed to implementing and enforcing the air quality plans and regulations applicable to the Denver Metropolitan ozone attainment/ maintenance area.

The CAA's Part D, pertaining to nonattainment plan provisions, requires the following items to be addressed:

- ◆ the implementation of reasonably available control measures, including reasonably available control technologies (RACT) for existing sources
- ◆ reasonable further progress (RFP) towards meeting attainment

- ◆ the identification and quantification of allowable emissions for new and modified stationary sources
- ◆ a stationary source permitting program
- ◆ other measures: enforceable emission limitations, other control measures, schedule for compliance
- ◆ compliance with section 110 provisions
- ◆ contingency measures

All of the requirements of Section 110 and Part D have been met, as is required for approval of this maintenance plan and redesignation request. Most of the requirements for Section 110 and Part D are general requirements applicable to the state implementation in general, not just the state implementation plan for controlling ozone in the Denver area. All such general requirements are already included in the state implementation plan and have already been approved by EPA. Any requirements of Section 110 and Part D that apply specifically to the control of ozone in the Denver attainment/maintenance area are addressed elsewhere in this maintenance plan.

Other Part D requirements that are applicable in nonattainment and maintenance areas include the general and transportation conformity provisions of CAA Section 176 (c). These provisions ensure that federally funded or approved projects and actions conform to the Denver State Implementation Plan Element/Maintenance Plan for ozone prior to the projects or actions being implemented. The State has already submitted to EPA a State Implementation Plan revision implementing the requirements of section 176(c).

## CHAPTER 3: MAINTENANCE PLAN

Section 107(d)(3)(E) of the CAA stipulates that for a nonattainment area to be redesignated to attainment, EPA must fully approve a maintenance plan which meets the requirements of CAA Section 175A. The maintenance plan is a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least ten years after redesignation by EPA.

Because EPA is allowed up to two years to approve redesignation requests after receiving a complete submittal, and given the time needed to complete the State processes for legislative approval and AQCC rule-making, the milestone year for this maintenance plan is 2013.

The EPA has established the core elements listed below as necessary for approval of maintenance plans:

- ◆ Description of the control measures for the maintenance period
- ◆ Emission inventories for current and future years
- ◆ Maintenance demonstration
- ◆ Mobile source emissions budget
- ◆ Approved monitoring network
- ◆ Verification of continued attainment
- ◆ Contingency plan
- ◆ Subsequent maintenance plan revisions

### A. Maintenance Plan Control Measures

The Denver metropolitan area will rely on the control programs listed below to demonstrate maintenance of the one-hour ozone standard through 2013. No emission reduction credit has been taken in the maintenance demonstration for any other current State or local control programs and no other such programs, strategies, or regulations shall be incorporated or deemed as enforceable measures for the purposes of this maintenance demonstration.

Control measures contained in the plan include:

1. Federal tailpipe standards and regulations, including those for small engines and non-road mobile sources. Credit is taken for these federal requirements but they are not part of the Colorado SIP.
2. Air Quality Control Commission Regulation No. 11 -- covering the Automobile Inspection and Readjustment (A.I.R.) Program -- as amended on January 10, 2000 and submitted to the EPA for approval on May 10, 2000 as part of the Denver area redesignation request and maintenance plan for carbon monoxide.

3. Air Quality Control Commission Regulations No. 3, No. 6, No. 7, and Common Provisions – covering industrial source control programs. The Common Provisions, Parts A and B of Regulation No. 3, and the VOC control requirements of Regulation No. 7 are already included in the approved SIP. Regulation No. 6, and Part C of Regulation No. 3, implement the federal standards of performance for new stationary sources and the federal operating permit program. The Maintenance Plan makes no changes to these regulations. This reference to Regulation No. 6 and Part C of Regulation No. 3 shall not be construed to mean that these regulations are included in the SIP.

In accordance with State and federal regulations and policies, the State and federal nonattainment NSR requirements (that once again become effective for the Denver area on January 16, 2001) will revert to the State and federal attainment PSD permitting requirements once EPA approves this redesignation request and maintenance plan.

Additionally, Regulation No. 3, Part B, Sections III.D.1.f was changed on March 21, 1996 to make it clear that permitting requirements for gasoline stations in the Denver Metropolitan ozone attainment maintenance area will continue to apply once the area is redesignated to attainment/maintenance. Also, Regulation No. 7, Section I, Applicability, was revised to state that the VOC control requirements of the rule continue to apply once the area is redesignated to attainment/maintenance. These rule revisions were submitted to EPA for approval by the Governor in August 1996.

4. Since 1991, gasoline sold in the Denver area during the summer ozone season (June 1 to September 15 for gasoline RVP) has been subject to a national Reid Vapor Pressure (RVP) limit of 7.8 pounds per square inch (psi) in order to reduce fuel volatility. For ethanol-blended fuels, the RVP limit is 8.8 psi. Since the Denver area has not violated the 1-hour standard since the late 1980's, the State has requested, and EPA has granted, waivers to allow a 9.0 psi RVP (10.0 psi for ethanol blends) gasoline in the Denver area instead of the more stringent 7.8 psi limit.

Since this maintenance plan incorporates a gasoline RVP limit of 9.0 psi, and since maintenance of the 1-hour ozone standard is shown for the entire time period from 1993 through 2013 with this limit, the State of Colorado requests that the 9.0 psi RVP limit (10.0 psi for ethanol blends) be made permanent for the Denver attainment maintenance area upon approval of the maintenance plan and redesignation request by EPA.

5. The following transportation control measures were included in the 1982 state implementation plan for ozone in the Denver nonattainment area (approved by EPA on December 12, 1983 (48 FR 55284). These measures, which are further described in Table 9 of the 1982 SIP, have all been implemented.
  - a. Transit improvements;
  - b. Rideshare programs;
  - c. A variable work hours program for federal employees;
  - d. A regional bicycle plan;
  - e. Two lanes on Santa Fe Drive reserved for High Occupancy Vehicles.



## B. Emission Inventories

This section presents emission inventories for the maintenance plan. Emission inventories are provided for the 1993 attainment year, the 2006 interim year, and the 2013 maintenance year.

The 1993 inventory incorporates the actual emissions and control measures in place at that time. The 2006 and 2013 inventories incorporate the maintenance plan control measures described above and projections of future emission levels from all sources.

All of the inventories are for the Denver attainment maintenance area (see Figure 2-1) and provide emissions estimates for a typical summer weekday during the summer ozone season (May through September). The ozone attainment maintenance area is used to establish the mobile source emissions budget for the region as discussed in subsequent sections of this plan.

All of the inventories were developed using EPA-approved emissions modeling methods, including MOBILE 5b, and updated transportation and demographics data from DRCOG. No credit in this analysis was taken for EPA's recently adopted Tier 2/Low Sulfur automobile emission standards at this time, though these new standards will result in significantly reduced VOC and NOx emissions from motor vehicles. The ozone maintenance plan technical support document contains detailed information on model assumptions and parameters for each source category.

### 1. Demographic and Transportation Data

At EPA's recommendation, this maintenance plan analysis is based on the emissions analysis that was performed for the recently completed Denver CO Redesignation Request and Maintenance Plan. The emission estimates were updated based on the most recent VMT estimates contained in DRCOG's conformity analysis for the updated fiscally constrained element of the Metro Vision 2020 regional transportation plan.

For comparison purposes, Table 3.1 shows the 2006 and 2013 VMT data used to develop the CO maintenance plan emission inventories and the 2010 and 2020 VMT estimates used in the conformity analysis. The new 2013 estimate was interpolated between 2010 and 2020.

**Table 3.1: Comparison of VMT Estimates – Ozone Attainment Maintenance Area**  
(millions of daily VMT)

Period	CO Maintenance Plan	Updated 2020 Conformity Analysis	Difference
2006	63.8	n/a	
2010		74.4	
2013	73.8	77.6	+ 5.2%
2020		85.0	

## 2. Emissions Inventory Data

The detailed emissions inventories for 1993, 2006 and 2013 are presented in Appendix A. Summaries of the VOC and NO<sub>x</sub> inventories are presented in Tables 3.2 and 3.3. The on-road mobile source numbers were increased by 5.2% to account for the updated VMT estimates :

<b>Table 3.2: SUMMARY VOC INVENTORY</b>			
<b>Tons per Summer Day</b>			
	<b>1993</b>	<b>2006</b>	<b>2013</b>
<b>ON ROAD MOBILE</b>			
Exhaust	91	65	56
Evaporative	28	20	18
Subtotal	<b>119</b>	<b>84</b>	<b>74</b>
<b>POINT SOURCES</b>			
Major	23	26	27
Minor	23	27	29
Subtotal	<b>46</b>	<b>52</b>	<b>56</b>
<b>AREA SOURCES</b>	<b>74</b>	<b>73</b>	<b>80</b>
<b>NON-ROAD MOBILE</b>	<b>58</b>	<b>39</b>	<b>38</b>
Subtotal	<b>296</b>	<b>248</b>	<b>248</b>
<b>BIOGENIC</b>	<b>211</b>	<b>211</b>	<b>211</b>
<b>TOTAL</b>	<b>507</b>	<b>460</b>	<b>459</b>

<b>Table 3.3: SUMMARY NO<sub>x</sub> INVENTORY</b>			
<b>Tons per Summer Day</b>			
	<b>1993</b>	<b>2006</b>	<b>2013</b>
<b>ON ROAD MOBILE</b>	<b>134</b>	<b>115</b>	<b>117</b>
<b>POINT SOURCES</b>			
Major	113	114	116
Minor	9	10	10
Subtotal	<b>122</b>	<b>123</b>	<b>126</b>
<b>AREA SOURCES</b>	<b>7</b>	<b>10</b>	<b>11</b>
<b>NON-ROAD MOBILE</b>	<b>65</b>	<b>57</b>	<b>50</b>
Subtotal	<b>328</b>	<b>305</b>	<b>304</b>
<b>BIOGENIC</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>TOTAL</b>	<b>332</b>	<b>309</b>	<b>308</b>

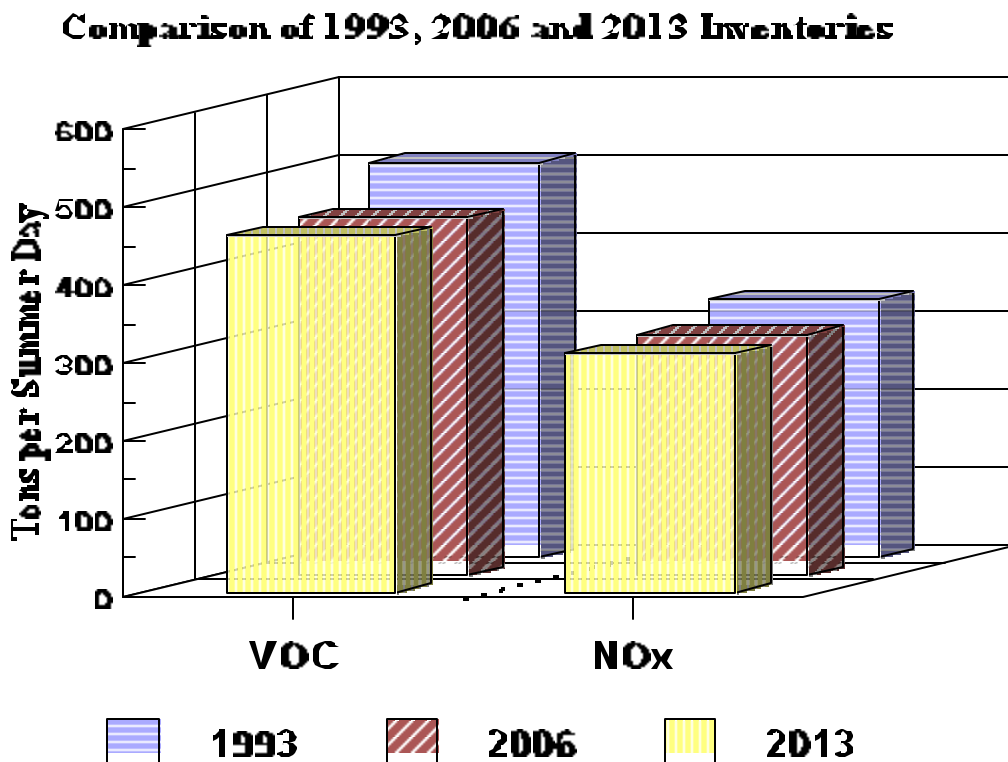
NOTE: Emissions estimates have been rounded to the nearest ton. Totals may not added due to rounding. For more detail see Appendix A - Emissions Inventories.

The emissions inventories include forecasted estimates from Denver International Airport (DIA) operations and construction.

### C. Maintenance Demonstration

As required by CAA Section 175A(a), each request for redesignation shall be accompanied by a SIP revision which provides for maintenance of the NAAQS for at least 10 years after redesignation. Following EPA guidance and policy (September 4, 1992 EPA memorandum from John Calcagni to EPA regional offices), this maintenance demonstration is made by comparing projected 2006 and 2013 emissions with the attainment year 1993 emissions. If 2006 and 2013 emissions are less than 1993 emissions, then maintenance is demonstrated. As illustrated in the emission inventory table, future year VOC and NO<sub>x</sub> emissions in the Denver area are less than 1993 emissions, and maintenance is shown.

A comparison of the differences in the attainment, interim and maintenance year inventories of the ozone precursors, VOC and NO<sub>x</sub>, are further demonstrated in the following chart:



The emission inventories show a steady downward trend in both VOC and NO<sub>x</sub> emissions, mainly because of more stringent motor vehicle tailpipe standards and federal standards on other source categories. Because of this steady downward trend and the fact future year emissions are considerably below 1993 levels, no increases in emissions are expected in intervening years between now and 2013 that will threaten the demonstration of maintenance.

## D. Motor Vehicle Ozone Precursors Emissions Budget

The transportation conformity provisions of section 176(c)(2)(A) of the CAA require regional transportation plans and programs to show that "...emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan..."

As noted above, the 2006 and 2013 regional emissions inventories for ozone precursors are below the level necessary to demonstrate continued maintenance of the ozone standard. Therefore, EPA's conformity regulation (40 CFR 93.124, August 15, 1997) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. The implementation plan can then allocate some or all of this additional "safety margin" to the emissions budget(s) for conformity purposes..

The available "safety margin" for VOC and NO<sub>x</sub> in the interim and maintenance years is demonstrated in the following table, with the level of emissions in 1993 demonstrating maintenance of the standard:

**Table 3.4: Changes in Inventory and Potential Margin of Safety**

	VOC INVENTORY (tpsd) <i>rounded to the nearest ton</i>					NO <sub>x</sub> INVENTORY (tpsd) <i>rounded to the nearest ton</i>				
	1993	2006	2006 Safety Margin*	2013	2013 Safety Margin*	1993	2006	2006 Safety Margin*	2013	2013 Safety Margin*
<b>Mobile Sources</b>	119	84	(35)	74	(45)	134	115	(19)	117	(17)
<b>All Other Anthropogenic Sources</b>	177	164	(13)	174	(3)	194	190	(4)	187	(7)
<b>Biogenic Sources</b>	211	211	0	211	0	4	4	0	4	0
<b>TOTAL INVENTORY</b>	507	460	(47)	459	(48)	332	309	(23)	308	(24)

\*"Safety margin" is difference between future year emissions and 1993 attainment year emissions. Totals may not add due to rounding.

This maintenance plan applies the available mobile source "safety margin" in 2006 and 2013 to the motor vehicle emissions budget for ozone precursors (VOC and NO<sub>x</sub>), resulting in emission budgets established at 1993 mobile source emission levels.

EPA's conformity regulation (40 CFR 93.118) also requires that motor vehicle emission budget(s) must be established for the last year of the maintenance plan, and may be established for any other years deemed appropriate. If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the

conformity regulation requires a “demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are no factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan.” The normal interagency consultation process required by the regulation shall determine what must be considered in order to make such a finding.

For years after the last year of the maintenance plan (in this case, 2013), a conformity determination must show that emissions are less than or equal to the maintenance plan’s motor vehicle emissions budget(s) for the last year of the maintenance plan.

This maintenance plan establishes the same emission budgets for all years 2002 and beyond, as summarized in the table below:

**Table 3.5: Motor Vehicle Emissions Budgets for VOC and NO<sub>x</sub>**  
*Ozone Attainment/Maintenance Area*

	VOC (tpsd)	NO <sub>x</sub> (tpsd)
2002 and beyond	119	134

#### **E. Monitoring Network / Verification of Continued Attainment**

Once the Denver metropolitan area has been redesignated to attainment status by EPA, the APCD will continue to operate an appropriate air quality monitoring network of NAMS and SLAMS monitors in accordance with 40 CFR Part 58 to verify the continued attainment of the one-hour ozone NAAQS. If measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) change significantly over time, the APCD will perform the appropriate studies to determine whether additional and/or re-sited monitors are necessary. Annual review of the NAMS/SLAMS air quality surveillance system will be conducted in accordance with 40 CFR 58.20(d) to determine whether the system continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58.

#### **F. Contingency Provisions**

Section 175A(d) of the CAA requires that the maintenance plan contain contingency provisions to assure that the State will promptly correct any violation of the one-hour ozone NAAQS standard which occurs after redesignation to attainment. Attainment areas are not required to have preselected contingency measures, just a list of measure that could be considered for future implementation.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once the need is triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

The triggering of the contingency plan does not automatically require a revision of the SIP, nor is the area necessarily redesignated once again to nonattainment. Instead, the State will normally have an appropriate amount of time to correct the violation by implementing one or more of the contingency measures as necessary. In the event that violations continue to occur after contingency measures have been implemented, additional contingency measures will be implemented until the violations are corrected.

## **1. Potential Contingency Measures**

Section 175A(d) of the CAA requires the Maintenance Plan to include as potential contingency measures all of the control measures contained in the SIP before redesignation which were relaxed or modified through the Maintenance Plan. For the Denver metropolitan area, this includes the enhanced vehicle inspection and maintenance program as described in AQCC Regulation No. 11 prior to the modifications adopted on January 10, 2000 as part of this Maintenance Plan. These modifications changed the I/M program by providing for the remote sensing clean screen program.

In addition to this potential contingency measure, the State may evaluate other potential strategies in order to address any future violations in the most appropriate and effective manner possible. Other potential measures include, but are not limited to:

- **Reid Vapor Pressure Reduction**

Colorado may consider requiring the reduction of gasoline RVP to below 9.0 psi throughout the Denver metro region during the summer ozone season. Consistent with provisions of the CAAA, this contingency measure may only be implemented upon the occurrence of an actual ozone violation. This possible contingency measure will require a Federal Register action by the EPA to change the Colorado RVP Table on 40 CFR 80.27, since this maintenance plan requests a permanent RVP limit of 9.0 psi upon approval of the plan by EPA. Full implementation of this measure will be required within 9 to 12 months of the decision to apply this measure.

- **Inspection/Maintenance Program Changes and Additions**

Colorado may consider changing the cutpoints for VOCs and/or NO<sub>x</sub> and adding evaporative controls to the existing Denver metro area enhanced I/M program. Once in effect the changes will take a full testing cycle (24 months) for full implementation.

- **Reinstate New Source Review Program**

Upon violation, Colorado may consider reinstatement of the nonattainment NSR program as a potential contingency measure.

- **Consumer and Commercial Products**

Colorado may consider regulations to restrict the sale, offer for sale or manufacture for sale any consumer product, such as personal care products, automotive and industrial maintenance products and pesticides products, which contain volatile organic compounds in excess of

specified limits, within the Denver metro area. Once adopted and in effect, stock turnover would be the limiting factor to full implementation.

- **Architectural Surface Coatings**

Colorado may consider regulations to restrict the sale, supply, offer for sale or solicit the application of architectural coatings, which contain volatile organic compounds in excess of specified limits, within the Denver Metro area. Once adopted and in effect, stock turnover would be the limiting factor to full implementation.

- **Lawn and Garden Equipment Use**

Colorado may consider regulations to restrict the use of gasoline powered lawn mowers on announced ozone alert days in the Denver Metro area. It is estimated that with an appropriate informational campaign that the citizens will respond, based on the response to woodburning controls.

- **NO<sub>x</sub> RACT for Major Sources**

If it is determined through additional analysis that NO<sub>x</sub> controls would contribute to achievement of the ozone NAAQS, Colorado may consider the adoption of regulations to control NO<sub>x</sub> emissions at a level determined to be Reasonably Available Control Technology (RACT) in the Denver metro area.

## **2. Tracking and Triggering Mechanisms**

### **a. Tracking**

The primary tracking plan for the Denver metropolitan area consists of continuous ozone monitoring by APCD as described above. APCD will notify EPA, the AQCC, the RAQC, and local governments in the Denver area of any exceedance of the one-hour NAAQS within 30 days of occurrence.

The ongoing regional transportation planning process carried out by the Denver Regional Council of Governments, in coordination with the RAQC, APCD, AQCC, and EPA, will serve as another means of tracking mobile source VOC and NO<sub>x</sub> precursor emissions into the future.

Since revisions to the region's transportation improvement programs are prepared every two years, and must go through a transportation conformity finding, this process will be used to periodically review progress toward meeting the VMT and mobile source emissions projections in this maintenance plan.

### **b. Triggering Contingency Measures**

An exceedance of the one-hour ozone NAAQS (any one-hour value over 0.125 ppm) may trigger a voluntary, local process by the RAQC and APCD to identify and evaluate potential contingency measures. However, the only federally-enforceable trigger for mandatory implementation of contingency measures shall be a violation of the one-hour ozone NAAQS. Specifically, the

three-year average of expected exceedances at a monitoring site would have to be greater than 1.0 for a violation to occur.

### **3. Process for Recommending and Implementing Contingency Measures**

The State will move forward with mandatory implementation of contingency measures under the SIP if a violation of the one-hour ozone NAAQS occurs.

No more than 60 days after being notified by the APCD that a violation of the one-hour ozone NAAQS has occurred, the RAQC, in coordination with the APCD and AQCC, will initiate a subcommittee process to begin evaluating potential contingency measures. The subcommittee will present recommendations to the RAQC within 120 days of notification and the RAQC will present recommended contingency measures to the AQCC within 180 days of notification.

The AQCC will then hold a public hearing to consider the contingency measures recommended by the RAQC, along with any other contingency measures the Commission believes may be appropriate to effectively address the violation. The necessary contingency measures will be adopted and implemented within one year after a violation occurs.

### **G. Subsequent Maintenance Plan Revisions**

As stated earlier, it is required that a maintenance plan revision be submitted to the EPA eight years after the original redesignation request/maintenance plan is approved - the purpose of this revision is to provide for maintenance of the NAAQS for an additional ten years following the first ten-year period. The State of Colorado commits to submit a revised maintenance plan eight years after redesignation to attainment, as required by the CAA and EPA.



# **APPENDIX A**

## **Emissions Inventories**

**Emissions Inventories - - Denver Ozone Attainment Maintenance Area**

SOURCE CATEGORY	1993	1993	2006	2006	2013	2013
	NOx	VOC	NOx	VOC	NOx	VOC
	(tpsd)	(tpsd)	(tpsd)	(tpsd)	(tpsd)	(tpsd)
<b>POINT SOURCES</b>						
Major	112.7	22.8	113.9	25.7	116.3	27.1
Minor	9.1	23.0	9.5	26.7	9.7	28.7
<b>POINT SOURCE-SUBTOTAL</b>	<b>121.8</b>	<b>45.8</b>	<b>123.4</b>	<b>52.4</b>	<b>126.0</b>	<b>55.8</b>
<b>ON-ROAD</b>						
Exhaust, Running Loss, Resting Loss	134.0	90.7	115.2	64.6	117.2	55.8
Evaporative and Refueling Loss	0.0	28.3	0.0	19.8	0.0	17.8
<b>ON-ROAD-SUBTOTAL</b>	<b>134.0</b>	<b>119.0</b>	<b>115.2</b>	<b>84.4</b>	<b>117.2</b>	<b>73.6</b>
<b>NON-ROAD</b>						
Aircraft	7.1	1.9	12.7	1.9	17.2	2.1
Locomotives	3.7	0.3	2.5	0.3	1.2	0.1
Construction Equipment	38.5	6.5	28.5	3.8	20.0	2.9
Industrial Equipment	4.5	2.0	3.6	1.6	3.1	1.6
Lawn and Garden/Logging	0.7	28.0	0.7	14.4	0.7	15.0
Farm Equipment	4.3	0.9	3.4	0.5	2.8	0.4
Airport Service Equipment	4.2	0.4	3.2	0.6	2.6	0.7
Light Commercial	1.1	7.7	1.2	5.0	1.0	4.9
Recreational Vehicles	0.0	2.6	0.0	3.2	0.0	3.5
Recreational Vessels	1.0	7.2	1.2	7.4	1.4	7.1
<b>NON-ROAD-SUBTOTAL</b>	<b>65.1</b>	<b>57.5</b>	<b>57.0</b>	<b>38.7</b>	<b>50.0</b>	<b>38.3</b>
<b>AREA SOURCES</b>						
Gasoline Distribution-Transport	0.0	0.3	0.0	0.4	0.0	0.5
Gasoline Distribution-Breathing Loss	0.0	0.6	0.0	0.8	0.0	0.9
Dry Cleaning*	0.0	0.0	0.0	0.0	0.0	0.0
Degreasing	0.0	12.8	0.0	6.6	0.0	7.3
Architectural Surface Coating	0.0	15.7	0.0	16.8	0.0	18.5
Auto Refinishing	0.0	13.6	0.0	12.8	0.0	14.0
Traffic Marking/Stripping	0.0	2.4	0.0	3.3	0.0	3.6
Graphic Arts	0.0	3.2	0.0	4.3	0.0	4.7
Asphalt Use	0.0	0.0	0.0	0.0	0.0	0.0
Pesticide Application	0.0	0.1	0.0	0.2	0.0	0.2
Commercial/Consumer Solvent Use	0.0	19.4	0.0	20.7	0.0	22.8
Publicly Owned Treatment Works	0.0	0.0	0.0	0.0	0.0	0.0
Wastewater Treatment	0.0	0.0	0.0	0.0	0.0	0.0
Treatment, Storage, and Disposal Facilities	0.0	0.0	0.0	0.0	0.0	0.0
Landfills	0.0	2.1	0.0	2.8	0.0	3.1
Leaking Underground Storage Tanks	0.0	1.4	0.0	1.4	0.0	1.4
Wood stove/Fireplaces	0.0	0.0	0.0	0.0	0.0	0.0
Bakeries	0.0	1.2	0.0	1.6	0.0	1.8
Natural Gas	6.8	0.4	9.7	0.5	10.8	0.6
Coal	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0
Breweries, Wineries, Distilleries	0.0	0.0	0.0	0.0	0.0	0.0
Accidental Releases	0.0	0.0	0.0	0.0	0.0	0.0
Synthetical Organic Chemical Tanks	0.0	0.0	0.0	0.0	0.0	0.0
Tank Truck, Rail Car, Drum Cleaning	0.0	0.0	0.0	0.0	0.0	0.0
Incineration	0.0	0.0	0.0	0.0	0.0	0.0
Forest fires/perscribed burns	0.0	0.0	0.0	0.0	0.0	0.0
Structural Fires	0.1	0.5	0.1	0.6	0.1	0.6
Open burning/Ag burning	0.0	0.0	0.0	0.0	0.0	0.0
Aircraft Engine Testing	0.0	0.0	0.0	0.0	0.0	0.0
Charcoal Grilling	0.0	0.0	0.0	0.0	0.0	0.0
<b>AREA SOURCE-SUBTOTAL</b>	<b>6.9</b>	<b>73.7</b>	<b>9.8</b>	<b>72.8</b>	<b>10.9</b>	<b>80.0</b>
<b>TOTAL FROM ANTHROPOGENIC SOURCES</b>	<b>327.8</b>	<b>296.0</b>	<b>305.4</b>	<b>248.3</b>	<b>304.1</b>	<b>247.7</b>
<b>BIOGENIC</b>	<b>3.7</b>	<b>211.2</b>	<b>3.7</b>	<b>211.2</b>	<b>3.7</b>	<b>211.2</b>
<b>TOTAL FROM ALL SOURCES</b>	<b>331.5</b>	<b>507.2</b>	<b>309.1</b>	<b>459.5</b>	<b>307.8</b>	<b>458.9</b>
Diff all other - mobile sources	197.5	388.2	193.9	375.1	190.6	385.3

tpsd = tons per summer day

\* Perchloroethylene, the primary solvent used in dry cleaning, is no longer considered to be a photochemical species

NOTE: Emission rates are reported with one decimal place precision to provide representation for smaller source categories. This level of precision is not intended to suggest a level of accuracy

## **APPENDIX B**

### **Changes to AQCC Ambient Air Quality Standards Regulation**

V. Emission Budgets for Nonattainment Areas in the State of Colorado

V.A. Budgets

V.A.1. The following Motor Vehicle Emissions Budgets shall be utilized to assess the conformity of Transportation Plans, TIPs, and where appropriate, Projects, for the applicable periods and geographic areas indicated:

<p><b>Denver Nonattainment Area (Modeling Domain)</b></p>	<p><u>PM<sub>10</sub></u>:            1995: 41.2 tons/day            1996-97: 44 tons/day            1998-2005: 54 tons/day            2006 and Beyond: 60 tons/day</p> <p><u>Nitrogen Oxides</u>            1995 and Beyond: 119.4 tons/day</p>
<p><b>Denver Attainment Maintenance Area</b></p>	<p>Ozone Precursors (attainment/maintenance area boundary):</p> <p>NO<sub>x</sub> 2002 and Beyond 134 tpsd</p> <p>VOC 2002 and Beyond 119 tpsd</p> <p>tpsd = tons per summer day</p> <p>Carbon Monoxide (attainment/maintenance area boundary)</p> <p>2000 1,125 tpd            2000 825 tpd            2002 and Beyond 800 tpd</p>
<p><b>Aspen (MODELING AREA)</b></p>	<p><u>PM<sub>10</sub></u></p> <p>2015 and Beyond: 16,244 lbs/day</p>
<p><b>Cañon City</b></p>	<p><u>PM<sub>10</sub></u>            1994-96: 4,981 lbs./day            1997 and Beyond: 7,439 lbs./day</p>
<p><b>Lamar</b></p>	<p><u>PM<sub>10</sub></u>            1994-96: 1,829 lbs./day            1997 and Beyond: 1,884 lbs./day</p>
<p><b>Pagosa Springs (Modeling Area)</b></p>	<p><u>PM<sub>10</sub></u>            2012 and Beyond: 7,486 lbs./day</p>

<b>Steamboat Springs (Modeling Area)</b>	<u>PM<sub>10</sub></u> 1999-2001: 16,661 lbs./day 2002 and Beyond: 20,682 lbs./day
<b>Telluride (Modeling Area)</b>	<u>PM<sub>10</sub></u> 2012 and Beyond: 10,001 lbs./day
<b>Longmont</b>	<u>Carbon Monoxide</u> 1998 and Beyond: 27 tons/day
<b>Colorado Springs</b>	<u>Carbon Monoxide</u> 2001 and Beyond: 270 tons/day

V.A.2. Geographic Coverage

Unless otherwise specified, the geographic coverage of each of the area Motor Vehicle Emissions Budgets shall be the nonattainment or attainment maintenance area as defined in the respective state implementation plans.

V.A.3. The Motor Vehicle Emissions Budget for PM<sub>10</sub> applies to total primary PM<sub>10</sub> emissions, including emissions from tailpipe exhaust, unpaved roads (except for the Denver PM<sub>10</sub> nonattainment area), reentrained road dust and street sand. It does not include precursor or secondary emissions, which, where appropriate, are covered under separate budgets.

V.A.4. Effective Dates

V.A.4.a. Denver Carbon Monoxide

The 800 tons-per-day carbon monoxide emission budget established in section V.A.1. shall take effect as a matter of state law when such budget takes effect as a matter of federal law pursuant to 40 CFR section 93.118. Until such time as the 800 tons-per-day budget takes effect pursuant to this section and 40 CFR section 93.118, the carbon monoxide emission budgets for the Denver CO Nonattainment Area shall be 1,125 tons per day for the period 1995-2000 and 825 tons per day for the period 2001 and beyond.

V.A.4.b. Colorado Springs Carbon Monoxide

The 270 tons-per-day carbon monoxide emission budget established in section V.A.1. shall take effect as a matter of state law when such budget takes effect as a matter of federal law pursuant to 40 CFR section 93.118. Until such time as the 270 tons-per-day budget takes effect pursuant to this section and 40 CFR section 93.118, the carbon monoxide emission budget for Colorado Springs CO Attainment/Maintenance Area shall be 212 tons-per-day.

V.A.4.c. Pagosa Springs PM-10

The 7,486 pounds-per-day PM-10 emission budget established in section V.A.1. shall take effect as a matter of state law when such budget takes effect as a matter of federal law pursuant to 40 CFR

section 93.118. Until such time as the 7,486 pounds-per-day budget takes effect pursuant to this section and 40 CFR section 93.118, the PM-10 emission budget for the Pagosa Springs PM-10 Nonattainment Area shall be 6,281 pounds-per-day

V.A.4.d. Telluride PM-10

The 10,001 pounds-per-day PM-10 emission budget established in section V.A.1. shall take effect as a matter of state law when such budget takes effect as a matter of federal law pursuant to 40 CFR section 93.118. Until such time as the 10,001 pounds-per-day budget takes effect pursuant to this section and 40 CFR section 93.118, the PM-10 emission budget for the Telluride PM-10 Nonattainment Area shall be 14,687 pounds-per-day.

V.A.4.e. Aspen PM-10

The 15,716 pounds-per-day PM-10 emission budget established in section V.A.1. shall take effect as a matter of state law when such budget takes effect as a matter of federal law pursuant to 40 CFR section 93.118. Until such time as the 15,716 pounds-per-day budget takes effect pursuant to this section and 40 CFR section 93.118, the PM-10 emission budget for the Aspen PM-10 Nonattainment Area shall be 13,974 pounds-per-day.

V.A.4.f. Denver Ozone

The 134 and 119 tpsd emission budgets established in section V.A.1. shall take effect as a matter of state law when such budget takes effect as a matter of federal law pursuant to 40 CFR section 93.118. Until such time as the 134 and 119 tpsd budgets take effect pursuant to this section and 40 CFR section 93.118, the criteria set out in 40 CFR 93.119 shall apply in lieu of the emissions budgets for ozone precursors for any determination required by federal law.