

# **COLORADO ANNUAL MONITORING NETWORK PLAN 2011 - 2012**



---

**Colorado Department  
of Public Health  
and Environment**

**Prepared by the Air Pollution Control Division  
Technical Services Program  
June 30, 2011**

# TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	<b>i</b>
<b>LIST OF FIGURES</b> .....	<b>iii</b>
<b>LIST OF TABLES</b> .....	<b>iii</b>
<b>I. INTRODUCTION</b> .....	<b>1</b>
Purpose of Network Plan .....	1
Overview of the Colorado Air Monitoring Network .....	1
APCD Monitoring History .....	2
APCD Monitoring Operations .....	2
Network Modification Procedures .....	3
Description of Monitoring Areas in Colorado .....	13
Eastern Plains Counties.....	14
Northern Front Range Counties .....	15
Southern Front Range Counties .....	15
Mountain Counties.....	15
Western Counties .....	16
State-wide Population Statistics.....	16
<b>II. CO</b> .....	<b>23</b>
Larimer and Weld Counties .....	23
Metropolitan Denver Counties.....	23
El Paso, Park & Teller Counties .....	24
Western Counties .....	24
QA/QC Checks for CO Monitors .....	24
Planned Changes in CO Monitoring .....	24
<b>III. O<sub>3</sub></b> .....	<b>25</b>
Larimer and Weld Counties .....	25
Metropolitan Denver Counties.....	25
El Paso, Park & Teller Counties .....	26
Western Counties .....	26
QA/QC Checks for O <sub>3</sub> Monitors.....	27
Planned Changes in O <sub>3</sub> Monitoring .....	27
<b>IV. NO<sub>2</sub>/NO<sub>y</sub></b> .....	<b>28</b>
Metropolitan Denver Counties.....	28
QA/QC Checks for NO <sub>x</sub> /NO <sub>y</sub> Monitors .....	28
Planned Changes in NO <sub>2</sub> /NO <sub>y</sub> Monitoring.....	29

<b>V.</b>	<b>SO<sub>2</sub></b> .....	<b>30</b>
	Metropolitan Denver Counties.....	30
	QA/QC Checks for SO <sub>2</sub> Monitors.....	30
	Planned Changes in SO <sub>2</sub> Monitoring .....	31
<b>VI.</b>	<b>PM<sub>10</sub></b> .....	<b>32</b>
	Larimer and Weld Counties .....	32
	Metropolitan Denver Counties.....	32
	Eastern Plains Counties.....	33
	Southern Front Range Counties .....	33
	Mountain Counties.....	34
	Western Counties .....	34
	Quality Assurance Checks for PM <sub>10</sub> Monitors.....	35
	Planned Changes in PM <sub>10</sub> Monitoring .....	35
<b>VII.</b>	<b>PM<sub>2.5</sub></b> .....	<b>36</b>
	Larimer and Weld Counties .....	36
	Metropolitan Denver Counties.....	36
	El Paso, Park, Pueblo, Elbert & Teller Counties .....	37
	Western Counties .....	38
	PM <sub>2.5</sub> , TEOM, and BAM Continuous Monitors not Intended for NAAQS Comparison ..	38
	Community Monitoring Zones .....	39
	Quality Assurance Checks for PM <sub>2.5</sub> Monitors.....	39
	Planned Changes in PM <sub>2.5</sub> Monitoring .....	40
<b>VIII.</b>	<b>TSP/Pb</b> .....	<b>41</b>
	Metropolitan Denver Counties.....	41
	Quality Assurance Checks for TSP/Pb Monitors.....	42
	Planned Changes in TSP and Lead Monitoring.....	42
<b>IX.</b>	<b>METEOROLOGICAL MEASUREMENTS</b> .....	<b>43</b>
	Planned Changes in Meteorological Monitoring for 2011/2012 .....	43
	<b>Appendix A - Monitoring Site Descriptions.....</b>	<b>A-1</b>
	<b>Appendix B - National Core (NCore) Monitoring Station Updates .....</b>	<b>B-1</b>

## LIST OF FIGURES

Figure 1. Monitoring Areas in Colorado .....	14
Figure 2. NCore Rooftop Sampler Layout .....	B-2

## LIST OF TABLES

Table 1. Monitoring Locations and Parameters Monitored .....	4
Table 2. Population Statistics and Monitors by County and Metropolitan Statistical Area .....	17
Table 3. 2010 Maximum CO Concentrations in Denver Area .....	23
Table 4. 2010 Maximum O <sub>3</sub> Concentrations in Larimer and Weld Counties .....	25
Table 5. 2010 Maximum O <sub>3</sub> Concentrations in the Denver Metro Area .....	26
Table 6. 2010 Maximum O <sub>3</sub> Concentrations in El Paso, Park and Teller Counties .....	26
Table 7. 2010 Maximum O <sub>3</sub> Concentrations in the Western Counties .....	27
Table 8. 2010 Maximum SO <sub>2</sub> Concentrations for the Denver Metro Area .....	30
Table 9. 2010 Maximum PM <sub>10</sub> Concentrations for the Denver Metro Area .....	33
Table 10. 2010 Maximum PM <sub>10</sub> Concentrations in the Southern Front Range Counties .....	34
Table 11. 2010 Maximum PM <sub>10</sub> Concentrations for the Mountain Counties .....	34
Table 12. 2010 Maximum PM <sub>10</sub> Concentrations in the Western Counties Area .....	35
Table 13. 2010 Maximum PM <sub>2.5</sub> Concentrations in Larimer and Weld Counties .....	36
Table 14. 2010 Maximum PM <sub>2.5</sub> Concentrations in the Denver Metro Area .....	37
Table 15. 2010 Max PM <sub>2.5</sub> Concentrations in the Southern Front Range Counties .....	37
Table 16. 2010 Maximum PM <sub>2.5</sub> Concentrations in the Western Counties .....	38
Table 17. Monitoring Site Locations and Instruments .....	A-1
Table 18. Parameters and Scale for the Denver Municipal Animal Shelter .....	B-1

## I. INTRODUCTION

The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division's (Division) 2010 Ambient Air Monitoring Network Plan is an examination and evaluation of the Division's network of air pollution monitoring stations. The Network Plan is an annual review of the Division's air monitoring network, as required by Title 40, Code of Federal Regulations, Part 58.10(a) [40 CFR 58.10(a)].<sup>1</sup> It is also a simple accounting of monitoring site changes expected for that year and the following year. It is due every July 1.

### **Purpose of Network Plan**

The purpose of the Network Plan is to provide an overview of the APCD's current air quality monitoring network and projected plans for the coming year. This plan shows the general reason for monitoring, the location of the monitor, and finally the type and frequency of measurements taken at each location. This is the fifth year that this review has been released to the general public for comment prior to its submittal to the U. S. Environmental Protection Agency (EPA) for approval. This change was initiated because of a change in Federal Regulations implemented in December 2006.

### **Overview of the Colorado Air Monitoring Network**

In 2011 the Colorado Air Pollution Control Division plans to operate monitors at 64 locations. In 2010, the APCD operated monitors at 63 separate locations (before monitors were removed). The Auraria (meteorology) site was removed in 2010. The Elbert County (background PM<sub>2.5</sub>) was removed in 2011. Three new sites will be added. The newest additions to the network for 2011 will be an ozone monitoring site in Moffat County, a replacement PM<sub>2.5</sub> background site, and a temporary air toxics monitoring site located in Kersey. Two additional temporary air toxics monitors will be placed at sites that are already established—CAMP and Platteville. Particulate monitors, including Total Suspended Particulates (TSP), Particulate Matter 10 microns and smaller (PM<sub>10</sub>), and Particulate Matter 2.5 microns and smaller (PM<sub>2.5</sub>) are the most abundant and widespread of monitoring types across the state. Currently, there are PM<sub>10</sub> monitors at 29 separate locations and PM<sub>2.5</sub> monitors at 19 separate locations. There are 20 meteorological sites in operation. These sites monitor wind speed, wind direction, resultant speed, resultant direction, standard deviation of horizontal wind direction and temperature. Two meteorological sites and the visibility site also monitor for relative humidity. Only six of the 63 locations monitored for gaseous and particulate pollutants in addition to taking meteorological measurements. Only four of those six locations monitored for more than ten parameters, with each meteorological and particulate parameter monitored being counted individually. All four of these monitoring locations are in the Denver Front Range area.

The APCD currently operates two TSP sites, one with a collocated monitor, and one that was added at the Centennial Airport on 4/3/2010. Both are used for lead analysis. Only three of the 29 PM<sub>10</sub> monitors are continuous "hourly," while eleven of the 28 PM<sub>2.5</sub> monitors also have collocated continuous monitors. Only three continuous PM<sub>2.5</sub> sites (Boulder Athens, NJH and Rifle) are not collocated with PM<sub>2.5</sub> FRM monitors. This difference reflects the age of the technology, as well as the availability and focus of EPA funding. Increasing the amount of

---

<sup>1</sup> "Annual Monitoring Network Plan and Periodic Network Assessment," 40 Federal Regulations 58.10 (1 July 2010), p. 248.

automated versus manual monitoring will require modifications to the particulate network, since in the current network these are primarily manually operated monitors.

Thirty-eight of the 62 currently monitoring sites have been in operation for ten or more years, and twenty-one of these have been in operation for 20 or more years. Nine monitoring sites have been in operation for more than 30 years. These sites are: Denver CAMP (46 years), Greeley-Hospital (44 years), Alamosa ASC (41 years), Arvada (38 years), Welby (37 years), Lamar Power Plant and Steamboat Springs (35 years), Lamar Municipal (34 years) and Highland Reservoir (33 years).

Three of the O<sub>3</sub> monitoring sites that are located on the western slope and have data included in this report are operated and maintained by a third party contractor, Air Resource Specialists (ARS). These are the Rifle, Palisade, and Cortez monitoring sites. They keep the sites in proper working order and perform calibration, data retrieval, and data validation, while the APCD uploads data to the AQS database and conducts independent audits of the sites for Quality Assurance (QA) purposes.

### **APCD Monitoring History**

The State of Colorado has been monitoring air quality statewide since the mid-1960s when high volume and tape particulate samplers, dustfall buckets, and sulfation candles were the best technology available for defining the magnitude and extent of the very visible air pollution problem. Monitoring for gaseous pollutants (carbon monoxide, sulfur dioxide, oxides of nitrogen and ozone) began in 1965 when the Federal Government established the CAMP station in downtown Denver at the intersection of 21<sup>st</sup> Street and Broadway Street. This was the area that was thought to represent the best probability for detecting maximum levels of most of the suspected pollutants. Instruments were primitive by comparison with those of today, and frequently were out of service.

Under provisions of the original Federal Clean Air Act of 1970, the Administrator of the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) designed to protect the public's health and welfare. Standards were set for total suspended particulate matter (TSP), carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>) and sulfur dioxide (SO<sub>2</sub>). In 1972, the first State Implementation Plan (SIP) was submitted to the EPA. It included an air quality surveillance system in accordance with EPA regulations of August 1971. That plan proposed a monitoring network of 100 monitors (particulate and gaseous) statewide. The system established as a result of that plan and subsequent modifications consisted of 106 monitors.

The 1977 Clean Air Act Amendments required States to submit revised SIP's to the EPA by January 1, 1979. The portion of the Colorado SIP pertaining to air monitoring was submitted separately on December 14, 1979, after a comprehensive review, and upon approval by the Colorado Air Quality Control Commission. The 1979 EPA requirements as set forth in 40 CFR 58.20 have resulted in considerable modification to the network. These, and subsequent modifications, are made to ensure consistency and compliance with Federal monitoring requirements. Station location, probe siting, sampling methodology, quality assurance practices and data handling procedures are all maintained throughout any changes made to the network.

### **APCD Monitoring Operations**

The APCD attempts to operate all of its monitors for a full calendar year, beginning

operation of new monitors in January and terminating existing monitors in December. Circumstances both in and out of the Division's control make that desired schedule generally difficult to achieve. The primary reason for this is that the APCD does not own either the land or the buildings where most of the monitors are located, and it is becoming increasingly more difficult to get property owner's permissions for use due to risk management issues.

When modifications to the State and Local Air Monitoring System (SLAMS) network are required, the Division will provide EPA Region VIII with the appropriate modification forms prior its implementation for their approval. All currently operating SLAMS monitors have been approved by EPA and meet the requirements set forth in 40 CFR 58, Appendices A, C, D and E.

### **Network Modification Procedures**

The APCD develops changes to its monitoring network in several ways. New monitoring locations have been added as a result of community concerns about air quality. Other monitors have been established as a result of special studies. Examples of this would be the O<sub>3</sub> monitoring in Aurora, Rifle, Cortez, Aspen Park, Rist Canyon, and Palisade. The Denver Firehouse #6 CO monitoring began in 1993 when models showed that the area around the fire station could have elevated CO concentrations.

The most common reasons for monitors being removed from the network are that either the land/building is modified, such that the site no longer meets current EPA siting criteria, the property ownership changes, or the area surrounding the monitor is being modified in a way that necessitates a change in the monitoring location. The most current examples of this are the Auraria meteorological monitoring station and the Elbert County PM<sub>2.5</sub> monitoring site. The Auraria station was removed due to the construction of a tall building in the immediate vicinity of the monitor that obstructed airflow around the monitoring site. The Elbert County instrument was removed from the site in May 2011 because the land ownership changed and the new owner did not want to continue monitoring on his property. Monitors are also removed from the network after review of the data shows that the levels have dropped to the point where it is no longer necessary to continue monitoring at that location. An example of this is the reduction of TSP lead (TSP-Pb) monitoring around the state from six monitors to one in 2006. However, new TSP-Pb monitors are currently being added due to a lowering of the lead standard in 2008. Another example of this type of change is the termination of CO monitoring at the NJH-E location. The CO concentrations at that location had dropped to the point that the Division, with EPA's approval, felt that the monitor could be better used elsewhere in the system.

Finally, all monitors are reviewed on a regular basis to determine if they are continuing to meet their monitoring objectives. Has the population, land use or vegetation around the monitor changed significantly since the monitor was established? If it has, is there a "better" location for the monitor?

Table 1 lists the locations and monitoring parameters of each site currently in operation, alphabetically by county, then numerically by site number. It lists the AQS identification numbers for each site, the site address and coordinates, the start dates and the site elevations. It further breaks down the monitor type, orientation/scale and the sampling frequency for each site. The parameter date is the date where valid data was first collected. Due to equipment problems this date can be significantly different than the site installation date, which is the "Started" date.

**Table 1. Monitoring Locations and Parameters Monitored**

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
<b>Adams</b>							
08 001 0006	Alsop Elementary School - Commerce City	7101 Birch St.	01/2001		39.826007	-104.937438	1,565
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	01/2001	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM <sub>2.5</sub>	1	01/2001	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM <sub>2.5</sub> Collocated	2	01/2001	P.O. Neigh	Partisol 2025	SLAMS	1 in 6
	PM <sub>2.5</sub>	3	06/2003	P.O. Neigh	TEOM-1400ab	SPM	Continuous
	PM <sub>2.5</sub> Speciation	5	02/2001	P.O. Neigh	SASS	Trends Spec	1 in 3
	PM <sub>2.5</sub> Carbon	5	02/2007	P.O. Neigh	URG 3000N	Trends Spec	1 in 3
	WS/WD/Temp	1	06/2003	Other	Met - One	Other	Continuous
08 001 3001	Welby	3174 E. 78 <sup>th</sup> Ave.	07/1973		39.838119	-104.94984	1,554
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	CO	1	07/1973	P.O. Neigh	Thermo 48C	SLAMS	Continuous
	SO <sub>2</sub>	2	07/1973	P.O. Neigh	API 100E	SLAMS	Continuous
	NO	2	01/1976	P.O. Urban	API 200E	Other	Continuous
	NO <sub>2</sub>	1	01/1976	P.O. Urban	API 200E	SLAMS	Continuous
	O <sub>3</sub>	2	07/1973	P.O. Neigh	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	01/1975	Other	Met - One	Other	Continuous
	PM <sub>10</sub>	1	02/1992	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM <sub>10</sub>	3	02/1992	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous
<b>Alamosa</b>							
08 003 0001	Alamosa – Adams State College	208 Edgemont Blvd	01/1970		37.469391	-105.878691	2,302
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	07/1989	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
08 003 0003	Alamosa – Municipal Bldg.	425 4 <sup>th</sup> St.	04/2002		37.469584	-105.863175	2,301
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	05/2002	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
<b>Arapahoe</b>							
08 005 0002	Highland Reservoir	8100 S. University Blvd	06/1978		39.567887	-104.957193	1,747
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	O <sub>3</sub>	1	06/1978	P.O. Neigh	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	07/1978	Other	Met - One	Other	Continuous
08 005 0005	Arapaho Community College (ACC)	6190 S. Santa Fe Dr.	12/1998		39.604399	-105.019526	1,636



<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>2.5</sub>	1	03/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
08 005 0006	Aurora - East	36001 E. Quincy Ave.		04/2010		39.63854	-104.56913	1,552
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	04/2010	P.O. Region	API 400A	SPM	Continuous	
	WS/WD/Temp	1	06/2010	Other	Met - One	Other	Continuous	
08 005 0007	Centennial Airport	7800 S. Peoria St.		04/2010		39.572304	-104.84881	1,774
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	TSP	1	4/2010	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	Pb	1	4/2010	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
<b>Archuleta</b>								
08 007 0001	Pagosa Springs Middle School	309 Lewis St.		09/1990		37.26842	-107.009659	2,165
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	3	09/1990	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
<b>Boulder</b>								
08 013 0003	Longmont-Municipal Bldg.	350 Kimbark St.		06/1985		40.164576	-105.100856	1,520
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	2	09/1985	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>2.5</sub>	1	01/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM <sub>2.5</sub>	3	11/2005	P.O. Neigh	TEOM 1400ab	SPM	Continuous	
08 013 0009	Longmont - Main	451 Kimbark St.		11/1989		40.166586	-105.102402	1,519
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	CO	1	11/1989	P.O. Micro	Thermo 48C	SLAMS	Continuous	
08 013 0011	South Boulder Creek	1405 ½ S. Foothills Parkway		06/1994		39.957212	-105.238458	1,669
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	06/1994	H.C. Urban	API 400E	SLAMS	Continuous	
08 013 0012	Boulder Chamber of Commerce	2440 Pearl St.		12/1994		40.021097	-105.263382	1,619
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	10/1994	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>2.5</sub>	1	01/1999	P.O. Middle*	Partisol 2025	SLAMS	1 in 3	
08 013 1001	Boulder - CU - Athens	2102 Athens St.		12/1980		40.012969	-105.264212	1,622
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	PM <sub>2.5</sub>	3	02/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous	
<b>Delta</b>								
08 029 0004	Delta Health Dept	560 Dodge St.		08/1993		38.739213	-108.073118	1,511
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	05/1993	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
<b>Denver</b>								
08 031 0002	Denver - CAMP	2105 Broadway		01/1965		39.751184	-104.987625	1,593
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	CO	2	01/1971	P.O. Micro	Thermo 48C	SLAMS	Continuous	
	SO <sub>2</sub>	1	01/1967	P.O. Neigh	API 100E	SLAMS	Continuous	
	NO	1	01/1973	Other	API 200E	Other	Continuous	
	NO <sub>2</sub>	1	01/1973	P.O. Neigh	API 200E	SLAMS	Continuous	
	WS/WD/Temp	1	01/1965	Other	Met - One	Other	Continuous	
	PM <sub>10</sub>	1	08/1986	P.O. Micro	SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>10</sub> Collocated	2	12/1987	P.O. Micro	SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>10</sub>	3	01/1988	P.O. Micro	TEOM-1400ab	SLAMS	Continuous	
	PM <sub>2.5</sub>	1	01/1999	P.O. Micro	Partisol 2025	SLAMS	1 in 1	
	PM <sub>2.5</sub> Collocated	2	09/2001	P.O. Micro	Partisol 2025	SLAMS	1 in 6	
	PM <sub>2.5</sub>	3	02/2001	P.O. Micro	TEOM FDMS	SPM	Continuous	
08 031 0013	Denver - NJH-E	14 <sup>th</sup> Ave. & Albion St.		01/1983		39.738578	-104.939925	1,620
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>2.5</sub>	3	07/2005	P.O. Neigh	TEOM FDMS	SPM	Continuous	
08 031 0014	Denver - Carriage	2325 Irving St.		06/1982		39.751761	-105.030681	1,621
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	2	01/1982	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	01/1983	Other	Met - One	Other	Continuous	
08 031 0016	DESCI	1901 E. 13 <sup>th</sup> Ave.				39.735700	-104.958200	1,623
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	Transmissometer	1	12/1989	Other	Optec LPV-2	SPM	Continuous	
	Nephelometer	1	12/2000	Other	Optec NGN-2	SPM	Continuous	
	Temp	1	12/1989	Other	Rotronics MP-101A	SPM	Continuous	
	Relative Humidity	1	12/1989	Other	Rotronics MP-101A	SPM	Continuous	
08 031 0017	Denver Visitor Center	225 W. Colfax		12/1992		39.740342	-104.991037	1,597
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	12/1992	P.O. Middle	SA/GMW-1200	SLAMS	1 in 1	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
08 031 0019	Denver - Firehouse #6	1300 Blake St.	11/1993		39.748163	-105.002564	1,585
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	CO	1	11/1993	P.O. Micro	Thermo 48C	SLAMS	Continuous
08 031 0023	Denver – Swansea Elementary School	4650 Columbine St	07/2002		39.781083	-104.95665	1,583
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>2.5</sub>	1	12/2004	P.O. Neigh	Partisol 2025	SPM	1 in 1
08 031 0025	Denver Municipal Animal Shelter (DMAS)	678 S. Jason St.	07/2005		39.704005	-104.998113	1,594
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	CO (Trace)	1	04/2010	P.O. Neigh	Thermo 48i- TLE	NCore	Continuous
	SO <sub>2</sub> (Trace)	1	01/2011	P.O. Neigh	Ecotech 9850T	NCore	Continuous
	NO <sub>y</sub>	1	01/2011	P.O. Neigh	API 200EU	NCore	Continuous
	O <sub>3</sub>	1	04/2008	Neigh/Urban	API 400E	NCore	Continuous
	WS/WD/Temp	1	07/2008	P.O. Neigh	Met - One	NCore	Continuous
	Relative Humidity	1	01/2011	P.O. Neigh	Rotronic	NCore	Continuous
	Barometric Pressure	1	+			NCore	Continuous
	Solar Radiation	1	+			NCore	Continuous
	Precipitation	1	+			NCore	Continuous
	Temp (L)	2	07/2008	P.O. Neigh	Met - One	NCore	Continuous
	TSP	1	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6
	TSP Collocated	2	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6
	Pb/TSP	1	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6
	Pb/TSP Collocated	2	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6
	PM <sub>10</sub>	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM <sub>10</sub> Collocated	2	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM <sub>10</sub>	3	07/2005	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous
	PM <sub>2.5</sub>	1	04/2007	P.O. Neigh	Partisol 2025	NCore	1 in 3
	PM <sub>2.5</sub>	3	07/2007	P.O. Neigh	TEOM FDMS	SPM	Continuous
	PM <sub>2.5</sub> Speciation	5	01/2010	P.O. Neigh	SASS	Supplemental Speciation	1 in 3
	PM <sub>2.5</sub> Carbon	5	01/2010	P.O. Neigh	URG 3000N	Supplemental Speciation	1 in 3
<b>Douglas</b>							
08 035 0004	Chatfield State Park	11500 N. Roxborough Pk Rd	04/2004		39.534488	-105.070358	1,676
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	O <sub>3</sub>	1	05/2005	H.C. Urban	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	04/2004	Other	Met - One	Other	Continuous	
	PM <sub>2.5</sub>	1	07/2005	P.O. Neigh	Partisol 2025	SPM	1 in 3	
	PM <sub>2.5</sub>	3	05/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous	
<b>El Paso</b>								
08 041 0013	U. S. Air Force Academy	USAFA Rd. 640		05/1996		39.958341	-104.817215	1,971
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	06/1996	P.O. Urban	API 400E	SLAMS	Continuous	
08 041 0015	Colorado Springs Hwy. 24	690 W. Hwy. 24		11/1998		39.830895	-104.839243	1,824
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	CO	1	11/1998	P.O. Micro	Thermo 48C	SLAMS	Continuous	
08 041 0016	Manitou Springs	101 Banks Pl.		04/2004		38.853097	-104.901289	1,955
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	04/2004	P.O. Neigh	API 400A	SLAMS	Continuous	
08 041 0017	Colorado Springs Colorado College	130 W. Cache La Poudre		11/2007		38.848014	-104.828564	1,832
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	11/2007	P.O. Neigh	Partisol 2000	SLAMS	1 in 3	
	PM <sub>2.5</sub>	1	01/2007	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM <sub>2.5</sub>	3	04/2008	P.O. Neigh	TEOM FDMS	SLAMS	Continuous	
<b>Fremont</b>								
08 043 0003	Cañon City – City Hall	128 Main St.		10/2004		38.43829	-105.24504	1,626
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	10/2004	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
<b>Garfield</b>								
08 045 0005	Parachute – Elem. School	100 E. 2nd St.		01/1982		38.453654	-108.053269	1,557
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	08/2000	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	WS/WD/Temp	1	03/2010	Other	RM Young/Viasla	Other	Continuous	
08 045 0007	Rifle–Henry Bldg	144 3rd St.		05/2005		39.531813	-107.782298	1,627
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	05/2005	P.O. Neigh	SA/GMW-1200	SPM	1 in 3	
	PM <sub>2.5</sub>	3	09/2008	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	PM <sub>10</sub>	3	09/2008	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM <sub>10-2.5</sub>	3	09/2008	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	WS/WD/Temp	1	09/2008	Other	RM Young/Viasla	Other	Continuous	
08 045 0012	Rifle – Health Dept	195 W. 14th Ave.		06/2008		39.54182	-107.784125	1,629
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	06/2008	P.O. Neigh	API 400E	SPM	Continuous	
<b>Gunnison</b>								
08 051 0004	Crested Butte	603 6th St.		09/1982		38.867595	-106.981436	2,714
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	2	06/1985	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	PM <sub>10</sub> Collocated	3	09/2008	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
08 051 0007	Mt. Crested Butte - Realty	19 Emmons Rd.		07/2005		38.900392	-106.966104	2,866
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
<b>Jefferson</b>								
08 059 0002	Arvada	9101 W. 57th Ave.		01/1973		39.800333	-105.099973	1,640
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	08/1973	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	01/1975	Other	Met - One	Other	Continuous	
08 059 0005	Welch	12400 W. Hwy. 285		08/1991		39.638781	-105.13948	1,742
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	08/1991	P.O. Urban	API 400A	SLAMS	Continuous	
	WS/WD/Temp	1	11/1991	Other	Met - One	Other	Continuous	
08 059 0006	Rocky Flats - N	16600 W. Hwy. 128		06/1992		39.912799	-105.188587	1,802
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	09/1992	H.C. Urban	API 400A	SLAMS	Continuous	
	WS/WD/Temp	1	09/1992	Other	Met - One	Other	Continuous	
08 059 0008	Rocky Flats - SE	9901 Indiana St.		06/1992		39.87639	-105.165611	1,716
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	WS/WD/Temp	1	08/1991	Other	Met - One	Other	Continuous	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
08 059 0011	NREL	2054 Quaker St.		06/1994		39.743724	-105.177989	1,832
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	06/1994	H.C. Urban	API 400A	SLAMS	Continuous	
08 059 0013	Aspen Park	26137 Conifer Rd.		04/2010		39.540321	-105.296512	2,467
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	04/2010	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	06/2010	Other	Met - One	Other	Continuous	
<b>La Plata</b>								
08 067 0004	Durango – River City Hall	1235 Camino del Rio		09/1985		37.277798	-107.880928	1,988
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	12/2002	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
<b>Larimer</b>								
08 069 0009	Fort Collins – CSU - Edison	251 Edison Dr.		12/1998		40.571288	-105.079693	1,524
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	PM <sub>10</sub>	1	04/1999	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	PM <sub>10</sub>	3	06/2009	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM <sub>2.5</sub>	1	07/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM <sub>2.5</sub>	3	06/2009	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM <sub>10-2.5</sub>	3	06/2009	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
08 069 0011	Fort Collins - West	3416 La Porte Ave.		05/2006		40.592543	-105.141122	1,571
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	05/2006	H.C. Urban	API 400E	SLAMS	Continuous	
08 069 0012	Rist Canyon	11835 Rist Canyon Rd.		04/2010		40.642135	-105.275105	2,058
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	04/2010	P.O. Urban	API 400E	SPM	Continuous	
	WS/WD/Temp	1	04/2010	Other	Met - One	Other	Continuous	
08 069 1004	Fort Collins - Mason	708 S. Mason St.		12/1980		40.57747	-105.07892	1,524
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	CO	1	12/1980	P.O. Neigh	Thermo 48C	SLAMS	Continuous	
	O <sub>3</sub>	1	12/1980	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	01/1981	Other	Met - One	Other	Continuous	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
<b>Mesa</b>							
08 077 0017	Grand Junction – Powell Bldg	650 South Ave.	02/2002		39.063798	-108.561173	1,398
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub> & NATTS Toxic Metals	3	01/2005	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM <sub>10</sub> Collocated & NATTS	4	03/2005	P.O. Neigh	Partisol 2000	SLAMS	1 in 6
	PM <sub>2.5</sub>	1	11/2002	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM <sub>2.5</sub>	3	08/2005	P.O. Neigh	TEOM 1400ab	SPM	Continuous
08 077 0018	Grand Junction - Pitkin	645 1/4 Pitkin Ave.	01/2004		39.064289	-108.56155	1,398
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	CO	1	01/2004	P.O. Micro	Thermo 48C	SLAMS	Continuous
	WS/WD/Temp	1	01/2004	Other	Met - One	Other	Continuous
	Relative Humidity	1	01/2004	Other	Rotronic	Other	Continuous
08 077 0019	Clifton - Sanitation	Hwy. 141 & D Rd.	10/2006		39.062514	-108.457382	1,413
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	10/2007	P.O. Neigh	SA/GMW -1200	SLAMS	1 in 3
08 077 0020	Palisade Water Treatment	Rapid Creek Rd.	05/2008		39.130575	-108.313853	1,512
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	O <sub>3</sub>	1	04/2008	P.O. Urban	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	04/2008	Other	RM Young	Other	Continuous
<b>Montezuma</b>							
08 083 0006	Cortez – Health Dept	106 W. North St.	06/2006		37.350054	-108.592337	1,890
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	O <sub>3</sub>	1	04/2010	P.O. Urban	API 400E	SPM	Continuous
	PM <sub>2.5</sub>	1	06/2008	P.O. Region	Partisol 2000	SPM	1 in 6
<b>Pitkin</b>							
08 097 0006	Aspen - Library	120 Mill St.	05/2003		39.19104	-106.818864	2,408
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	05/2003	P.O. Neigh	SA/GWM 1200	SLAMS	1 in 3
<b>Prowers</b>							
08 099 0001	Lamar Power Plant	100 N. 2nd St.	08/1975		38.090949	-102.613912	1,107
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	2	02/1992	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
08 099 0002	Lamar Municipal	104 E. Parmenter St.	12/1976		38.084688	-102.618641	1,107
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	2	02/1992	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
08 099 0003	Lamar Port of Entry	7100 US Hwy. 50	03/2005		38.113792	-102.626181	1,108
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	WS/WD/Temp	1	03/2005	Other	Met - One	Other	Continuous
<b>Pueblo</b>							
08 101 0015	Pueblo – Fountain School	925 N. Glendale Ave.	06/2010		38.276099	-104.597613	1,433
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	06/2009	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
	PM <sub>2.5</sub>	1	06/2009	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
<b>Routt</b>							
08 107 0003	Steamboat Springs	136 6th St.	09/1975		40.485201	-106.831625	2,054
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	2	10/1986	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
<b>San Miguel</b>							
08 113 0004	Telluride	333 W. Colorado Ave.	03/1990		37.937872	-107.813061	2,684
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	03/1990	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
<b>Summit</b>							
08 117 0002	Breckenridge	501 N. Park Ave.	04/1992		39.491461	-106.047325	2,904
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	1	05/1992	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
<b>Weld</b>							
08 123 0006	Greeley-Hospital	1516 Hospital Rd.	04/1967		40.414877	-104.70693	1,441
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>10</sub>	2	10/1996	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
	PM <sub>2.5</sub>	1	08/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM <sub>2.5</sub>	3	06/2003	P.O. Neigh	TEOM - 1400ab	SPM	Continuous
08 123 0008	Platteville Middle School	1004 Main St.	12/1998		40.209387	-104.82405	1,469
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>
	PM <sub>2.5</sub>	1	02/1999	P.O. Region	Partisol 2025	SLAMS	1 in 3
	PM <sub>2.5</sub> Speciation	5	12/2001	P.O. Region	SASS	Spec Trends	1 in 6



<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	PM <sub>2.5</sub> Carbon	5	12/2001	P.O. Neigh	URG 3000N	Spec Trends	1 in 6	
08 123 0009	Greeley –County Tower	3101 35th Ave.		06/2002		40.386368	-104.73744	1,484
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	O <sub>3</sub>	1	06/2002	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	+	Other	Met - One	Other	Continuous	
08 123 0010	Greeley – West Annex	905 10th Ave.		12/2003		40.423432	-104.69479	1,421
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	CO	1	12/2003	P.O. Neigh	Thermo 48C	SLAMS	Continuous	

The following abbreviations were used in Table 1, with orientation (Orient) referring to the reason why the monitor was placed in that location, and scale referring to the size of the area that concentrations from the monitor represent.

**Orientation**

- P.O. - Population oriented
- Back - Background orientation
- SPM - Special Projects Monitor
- H.C. - Highest Concentration
- POC - Parameter Occurrence Code

**Scale (Area Represented)<sup>2</sup>**

- Micro - Micro-scale (several m – 100 m)
- Middle - Middle Scale (100 – 500 m)
- Neigh - Neighborhood Scale (0.5 – 4 km)
- Urban - Urban Scale (4 – 50 km)
- Regional - Regional Scale (50 – hundreds of km)

Also included in the above table are listings as “Other” which are meteorological monitors that do not include either orientation or scale. A “+” in the “Start” column indicates that the monitor has not yet been installed.

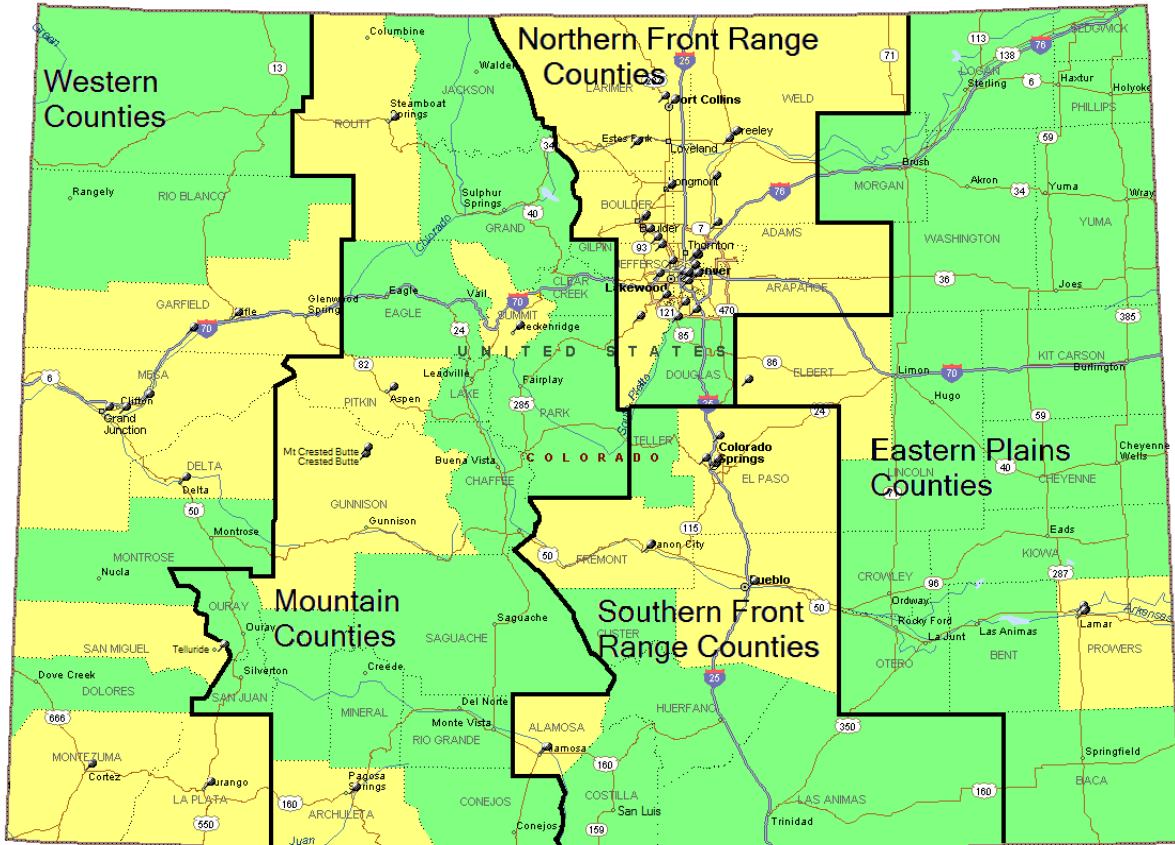
**Description of Monitoring Areas in Colorado**

The state has been divided into five multi-county areas that are generally based on topography. The areas are: (1) the Eastern Plains, (2) the Northern Front Range, (3) the Southern Front Range, (4) the Mountains, and (5) the Western Counties. These divisions are a somewhat arbitrary grouping of monitoring sites that have similar characteristics.

The Eastern Plains consist of those counties east of the urbanized I-25 corridor to the eastern border of Colorado from the northern to the southern border. These counties are generally rolling agricultural plains below the elevation of 6,000 feet. The Front Range counties are generally those along the I-25 corridor from the northern border to the southern border. They are split into north and south areas with the Palmer Ridge being the dividing area. While the northern counties all have a direct association with I-25, that association is not as well defined in the southern counties. Teller, Fremont, Custer, Alamosa and Costilla counties are included with the Southern Front Range Counties because they have more in common meteorologically with

<sup>2</sup> “Appendix D to Part 58 – Network Design Criteria for Ambient Air Quality Monitoring,” 40 Federal Register 58 (1 July 2010), pp. 290-292.

that group than they do with the Mountain counties. The Mountain counties are generally those counties along the Continental Divide. The Western Counties are those adjacent to the Utah border. Other divisions can and have been made, but these five divisions seemed appropriate for this report. Figure 1 shows the approximate boundaries of these areas.



**Figure 1. Monitoring Areas in Colorado<sup>3</sup>**

**Eastern Plains Counties**

The Eastern Plains Counties are those east of the urbanized I-25 corridor. Historically, there have been a number of communities that were monitored for particulates and meteorology but not for any of the gaseous pollutants. In the northeast along the I-76 corridor, the communities of Sterling, Brush and Fort Morgan have been monitored. Along the I-70 corridor only the community of Limon has been monitored for particulates. Along the US-50/Arkansas River corridor the Division has monitored for particulates in the communities of La Junta, Rocky Ford and Trinidad. These monitoring sites were all discontinued in the late 1970s and early 1990s after a review showed that the concentrations were well below the standard and trending downward.

For the Eastern Plains Counties there are currently two PM<sub>10</sub> monitoring sites in Lamar and no gaseous pollutant monitoring sites in the area. Quite often, exceedances of the

<sup>3</sup> Counties with monitors are in yellow and the pin symbols on the map show the approximate location of the monitors within the county.

standard are associated with natural events from regional high winds/blowing dust and dry soils that can occur anytime of the year, but with a slightly higher frequency in the springtime. These regional dust storms are natural events that are uncontrollable and are being investigated and documented by the Division as exceptional events.

### **Northern Front Range Counties**

The Northern Front Range Counties are those along the urbanized I-25 corridor from the Colorado/Wyoming border to just south of the city of Castle Rock. This area has the majority of the larger cities in the state. The majority of the monitoring sites are located in the Denver-metro area and the rest are located in or near Boulder, Fort Collins, Greeley, Longmont and Platteville.

Currently, there are 29 gaseous pollutant monitoring sites and 24 particulate monitoring sites in the Northern Front Range area. There are seven CO, 16 O<sub>3</sub>, two NO<sub>2</sub>, one NO<sub>y</sub>, and three SO<sub>2</sub> monitoring sites. There are nine PM<sub>10</sub>, 13 PM<sub>2.5</sub>, and two TSP/Pb monitoring sites.

### **Southern Front Range Counties**

The Southern Front Range Counties are those along the urbanized I-25 corridor from south of the city of Castle Rock to the southern Colorado border. The cities with monitoring in the area are Colorado Springs, Pueblo, Cañon City and Alamosa. These last two cities are not strictly in the Front Range I-25 corridor but meteorologically fit better with those cities than they do the Mountain Counties. Colorado Springs is the only city in the area that is monitored for CO and O<sub>3</sub> by the APCD. The other cities are only monitored for particulates. In the past the APCD has conducted particulate monitoring in both Walsenburg and Trinidad but that monitoring was discontinued in 1979 and 1985 respectively, due to low concentrations.

Currently, there are three gaseous pollutant monitoring sites and eight particulate monitoring sites in the Southern Front Range area. There are one CO and two O<sub>3</sub> monitoring sites in the Colorado Springs area. There are five PM<sub>10</sub> and two PM<sub>2.5</sub> monitoring sites in the region and a replacement site for the Elbert background site may be installed in Elbert County, which is in the Southern Front Range region or Douglas County, which is in the Northern Front Range region.

### **Mountain Counties**

The Mountain Counties are generally those that are on or near the Continental Divide. They consist of mostly small towns located in tight mountain valleys. Their primary monitoring concern is with particulate pollution from wood burning and road sanding. Although, all recent PM<sub>10</sub> exceedances have been caused by dust storms due to regional blowing dust/high wind events. These regional dust storms are natural events that are uncontrollable and are being investigated and documented by the Division as exceptional events. These communities range from Steamboat Springs in the north to Breckenridge in the I-70 corridor, as well as Aspen, Crested Butte and Mt. Crested Butte in the central mountains and Pagosa Springs in the south.

Currently, there are no gaseous and six particulate monitoring sites operated by the APCD in the Mountain Counties region.

## **Western Counties**

The Western Counties are generally smaller towns, and are usually located in fairly broad river valleys. Grand Junction is the only large city in the area, and the only location that monitors for CO and air toxics on the western slope. The particulate and O<sub>3</sub> monitoring sites are located in Clifton, Cortez, Delta, Durango, Grand Junction, Palisade, Parachute, Rifle and Telluride.

Currently, there are four gaseous pollutant monitoring sites and 11 particulate monitoring sites in the Western Counties area. There are one CO and three O<sub>3</sub> monitoring sites. There are seven PM<sub>10</sub> and four PM<sub>2.5</sub> monitoring sites (two in Grand Junction). There have been several PM<sub>10</sub> exceedances in recent years (past 10 years). All recent exceedances in this region have been caused by dust storms from regional blowing dust/high wind events. These regional dust storms are natural events that are uncontrollable and are being investigated and documented by the Division as exceptional events.

## **State-wide Population Statistics**

Table 2 is a listing of the projected population statistics by county. The counties have been grouped into Planning and Management Regions (per Colorado Executive Orders of November 1972, 1973 and 1986, and October 1998), Metropolitan Statistical Areas (per the US Office of Management and Budget, June 30, 1993), and Sub-state Regions (i.e., Front Range, Western Slope, Eastern Plains, etc.). The Sub-state Regional grouping typically varies from data user to data user. For the purposes of this assessment, the groupings used were as similar to the State's monitoring regions as possible.

**Table 2. Population Statistics and Monitors by County and Metropolitan Statistical Area**

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % Change		CO	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	WS WD T	Rel. Hum	Precip	TSP	Pb	PM <sub>10</sub> Hi- Vol & Crs.	PM <sub>10</sub> Lo- Vol & Cont.	PM <sub>2.5</sub> FRM & Carb.	PM <sub>2.5</sub> Cont. & SASS	
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20															
<b>COLORADO</b>	<b>5,029,196</b>	<b>5,499,618</b>	<b>6,043,504</b>	<b>1.7%</b>	<b>1.9%</b>	<b>9</b>	<b>2</b>	<b>2</b>		<b>21</b>	<b>20</b>	<b>3</b>		<b>3</b>	<b>3</b>	<b>31</b>	<b>8</b>	<b>20</b>	<b>15</b>	
<b>FRONT RANGE</b>	<b>4,141,359</b>	<b>4,502,677</b>	<b>4,907,962</b>	<b>1.6%</b>	<b>1.7%</b>															
Adams	441,603	490,042	539,700	2.0%	1.9%						1						1	1 1/C 1/E	1 1/S	
	08 001 0006 Alsup Elementary School - Commerce City										1						1	1 1/C 1/E	1 1/S	
	08 001 3001 Welby					1	1	1		1	1					1	1			
Arapahoe	572,003	621,033	671,384	1.6%	1.6%															
	08 005 0002 Highland Reservoir									1	1									
	08 005 0005 Arapahoe Community College																	1		
	08 005 0006 Aurora East									1	1									
	08 005 0007 Centennial Airport													1	1					
Broomfield	55,889	63,988	71,939	2.7%	2.4%															
Denver	600,158	642,108	665,494	1.3%	0.7%															
	08 031 0002 Denver CAMP					1	1	1			1						1 1/C	1	1 1/C	1
	08 031 0013 Denver NJH																			1
	08 031 0014 Denver Carriage									1	1									
	08 031 0017 Denver Visitor Center																1			
	08 031 0019 Denver Firehouse #6					1														
	08 031 0023 Denver Swansea Elementary																		1	
	08 031 0025 Denver Animal Shelter					1	1		1	1	1	1	+	1 1/C	1 1/ C	1 1/C	1	1 1/E	1 1/S	
Douglas	285,465	324,049	377,520	2.5%	3.1%															
	08 035 0004 Chatfield State Park									1	1								1	1
Jefferson	534,543	557,179	590,327	0.8%	1.2%															
	08 059 0002 Arvada									1	1									
	08 059 0005 Welch									1	1									

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % Change		CO	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	WS WD T	Rel. Hum	Precip	TSP	Pb	PM <sub>10</sub> Hi- Vol & Crs.	PM <sub>10</sub> Lo- Vol & Cont.	PM <sub>2.5</sub> FRM & Carb.	PM <sub>2.5</sub> Cont. & SASS			
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20																	
	08 059 0006 Rocky Flats - N									1	1											
	08 059 0008 Rocky Flats - SE										1											
	08 059 0011 NREL									1												
	08 059 0013 Aspen Park									1	1											
<b>BOULDER PMSA/Co</b>	<b>294,567</b>	<b>312,847</b>	<b>332,025</b>	<b>1.2%</b>	<b>1.2%</b>																	
	08 013 0003 Longmont – Municipal Bldg.															1		1	1			
	08 013 0009 Longmont – Main					1																
	08 013 0011 South Boulder Creek									1												
	08 013 0012 Boulder Chamber of Commerce															1		1				
	08 013 1001 Boulder CU/Athens																				1	
<b>N. FRONT RANGE</b>	<b>552,455</b>	<b>618,643</b>	<b>705,495</b>	<b>2.2%</b>	<b>2.7%</b>																	
<b>FORT COLLINS MSA</b>	<b>299,630</b>	<b>326,488</b>	<b>361,313</b>	<b>1.7%</b>	<b>2.0%</b>																	
	08 069 0009 Fort Collins – CSU – Edison															1 1/R	1	1	1			
	08 069 0011 Fort Collins - West									1												
	08 069 0012 Rist Canyon									1	1											
	08 069 1004 Fort Collins – Mason					1				1	1											
<b>GREELEY MSA</b>	<b>252,825</b>	<b>292,155</b>	<b>344,182</b>	<b>2.8%</b>	<b>3.3%</b>																	
	08 123 0006 Greeley Hospital															1		1	1			
	08 123 0008 Platteville																	1 1/E	1/S			
	08 123 0009 Greeley – Tower									1	+											
	08 123 0010 Greeley - West Annex					1																

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % Change		CO	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	WS WD T	Rel. Hum	Precip	TSP	Pb	PM <sub>10</sub> Hi- Vol & Crs.	PM <sub>10</sub> Lo- Vol & Cont.	PM <sub>2.5</sub> FRM & Carb.	PM <sub>2.5</sub> Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 - 20														
<b>S. FRONT RANGE</b>	<b>804,676</b>	<b>873,659</b>	<b>955,236</b>	<b>0.79%</b>	<b>1.8%</b>														
<b>COLO. SPRINGS MSA</b>	<b>645,613</b>	<b>700,903</b>	<b>765,803</b>	<b>1.5%</b>	<b>1.8%</b>														
El Paso	622,263	675,046	737,052	1.5%	1.8%					1									
	08 041 0013 USAFA																		
	08 041 0015 Colorado Springs - Hwy-24					1													
	08 041 0016 Manitou Springs									1									
	08 041 0017 Colorado Springs - Colorado College															1	1	1	
Teller	23,350	25,857	28,751	2.0%	2.1%														
<b>PUEBLO MSA</b>	<b>159,063</b>	<b>171,886</b>	<b>188,275</b>	<b>1.5%</b>	<b>1.8%</b>														
	08 101 0015 Pueblo – Fountain School															1		1	
<b>WESTERN SLOPE</b>	<b>552,564</b>	<b>628,306</b>	<b>721,981</b>	<b>2.5%</b>	<b>2.8%</b>														
<b>REGION 9</b>	<b>91,716</b>	<b>103,176</b>	<b>116,857</b>	<b>2.3%</b>	<b>2.5%</b>														
Archuleta	12,084	14,366	17,147	3.4%	3.6%														
	08 007 0001 Pagosa Springs School															1			
Dolores	2,064	2,235	2,428	1.5%	1.7%														
La Plata	51,334	57,901	65,698	2.4%	2.6%														
	08 067 0004 Durango – River City Hall															1			
Montezuma	25,535	27,931	30,843	1.8%	2.0%														
	08 083 0006 Cortez									1								1	
San Juan	699	743	741	1.1%	0.1%														
<b>REGION 10</b>	<b>105,333</b>	<b>114,583</b>	<b>131,224</b>	<b>2.6%</b>	<b>2.7%</b>														
Delta	30,952	35,612	41,445	2.8%	3.1%														
	08 029 0004 Delta Health Dept.															1			

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % Change		CO	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	WS WD T	Rel. Hum	Precip	TSP	Pb	PM <sub>10</sub> Hi- Vol & Crs.	PM <sub>10</sub> Lo- Vol & Cont.	PM <sub>2.5</sub> FRM & Carb.	PM <sub>2.5</sub> Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 - 20														
Gunnison	15,324	16,414	17,786	1.3%	1.6%														
	08 051 0004 Crested Butte															1			
	08 051 0007 Mt. Crested Butte Realty															1			
Hinsdale	843	951	1,043	2.4%	1.9%														
Montrose	41,276	47,618	54,806	2.8%	2.9%														
Ouray	4,436	5,274	5,980	3.4%	2.5%														
San Miguel	7,359	8,714	10,164	3.3%	3.1%														
	08 113 0004 Telluride															1			
<b>REGION 11</b>	<b>247,082</b>	<b>281,228</b>	<b>326,207</b>	<b>2.5%</b>	<b>3.0%</b>														
Garfield	56,389	68,807	88,490	3.9%	5.2%														
	08 045 0005 Parachute – Elem. School										1					1			
	08 045 0007 Rifle - Henry Building										1					1			1
	08 045 0012 Rifle – Health Dept.									1									
Mesa	146,723	163,019	180,949	2.0%	2.1%														
	08 077 0017 Grand Junction – Powell																1	1	1
	08 077 0018 Grand Junction – Pitkin					1					1	1							
	08 077 0019 Clifton															1			
	08 077 0020 Palisade Water Treatment									1	1								
Moffat	13,795	14,800	16,812	1.3%	2.6%														
Rio Blanco	6,666	7,966	9,476	3.2%	3.5%														
Routt	23,509	26,636	30,480	2.5%	2.7%														
	08 107 0003 Steamboat Springs															1			
<b>REGION 12</b>	<b>113,576</b>	<b>129,319</b>	<b>147,693</b>	<b>2.6%</b>	<b>2.7%</b>														
Eagle	52,197	60,260	68,299	2.8%	2.5%														
Grand	14,843	16,748	19,665	2.3%	3.3%														
Jackson	1,394	1,465	1,550	0.9%	1.1%														
Pitkin	17,148	19,009	21,260	2.0%	2.3%														
	08 097 0006 Aspen – Library															1			



REGIONS/COUNTIES	Actual Population	Projected Population		Avg. Annual % Change		CO	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	WS WD T	Rel. Hum	Precip	TSP	Pb	PM <sub>10</sub> Hi- Vol & Crs.	PM <sub>10</sub> Lo- Vol & Cont.	PM <sub>2.5</sub> FRM & Carb.	PM <sub>2.5</sub> Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20														
Summit	27,994	31,837	36,919	2.6%	3.0%														
	08 117 0002 Breckenridge															1			
<b>CENTRAL MTNS.</b>	<b>129,151</b>	<b>145,651</b>	<b>166,162</b>	<b>2.4%</b>	<b>2.7%</b>														
<b>CLR CRK. &amp; GILPIN</b>	<b>14,529</b>	<b>15,997</b>	<b>17,749</b>	<b>1.9%</b>	<b>2.1%</b>														
Clear Creek	9,088	10,033	11,192	2.0%	2.2%														
Gilpin	5,441	5,964	6,557	1.8%	1.9%														
<b>PARK COUNTY</b>	<b>16,206</b>	<b>19,714</b>	<b>24,100</b>	<b>3.9%</b>	<b>4.1%</b>														
<b>REGION 13</b>	<b>76,198</b>	<b>85,454</b>	<b>96,905</b>	<b>2.3%</b>	<b>2.5%</b>														
Chaffee	17,809	19,832	22,982	2.1%	3.0%														
Custer	4,255	5,079	5,973	3.5%	3.3%														
Fremont	46,824	51,117	56,261	1.7%	1.9%														
	08 043 0003 Cañon City - City Hall															1			
Lake	7,310	9,426	11,689	5.1%	4.4%														
<b>REGION 14</b>	<b>22,218</b>	<b>24,486</b>	<b>27,409</b>	<b>1.9%</b>	<b>2.3%</b>														
Huerfano	6,711	7,345	8,352	1.8%	2.6%														
Las Animas	15,507	17,141	19,057	2.0%	2.1%														
<b>SAN LUIS VALLEY</b>	<b>46,027</b>	<b>49,573</b>	<b>53,525</b>	<b>1.5%</b>	<b>1.5%</b>														
Alamosa	15,445	17,076	18,815	2.0%	2.0%														
	08 003 0001 Alamosa – Adams State College															1			
	08 003 0003 Alamosa – Municipal															1			
Conejos	8,256	8,671	9,056	1.0%	0.9%														
Costilla	3,524	3,661	3,811	0.7%	0.8%														
Mineral	712	779	857	2.0%	1.9%														
Rio Grande	11,982	12,683	13,675	1.2%	1.5%														
Saguache	6,108	6,703	7,311	1.9%	1.9%														

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % Change		CO	SO <sub>2</sub>	NO <sub>x</sub>	NO <sub>y</sub>	O <sub>3</sub>	WS WD T	Rel. Hum	Precip	TSP	Pb	PM <sub>10</sub> Hi-Vol & Crs.	PM <sub>10</sub> Lo-Vol & Cont.	PM <sub>2.5</sub> FRM & Carb.	PM <sub>2.5</sub> Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 - 20														
<b>EASTERN PLAINS</b>	<b>160,095</b>	<b>173,411</b>	<b>193,873</b>	<b>1.6%</b>	<b>2.3%</b>														
<b>REGION 1</b>	<b>72,546</b>	<b>77,772</b>	<b>85,040</b>	<b>1.4%</b>	<b>1.8%</b>														
Logan	22,709	24,774	27,450	1.4%	1.8%														
Morgan	28,159	30,667	34,516	1.7%	2.4%														
Phillips	4,442	4,518	4,640	0.4%	0.5%														
Sedgwick	2,379	2,500	2,621	1.0%	0.9%														
Washington	4,814	4,877	4,938	0.2%	0.2%														
Yuma	10,043	10,436	10,875	0.8%	0.8%														
<b>REGION 5</b>	<b>38,659</b>	<b>45,117</b>	<b>56,446</b>	<b>3.1%</b>	<b>4.6%</b>														
Cheyenne	1,836	1,948	2,085	1.1%	1.4%														
Elbert	23,086	28,915	39,483	4.5%	6.4%														
Kit Carson	8,270	8,530	8,787	0.6%	0.6%														
Lincoln	5,467	5,724	6,091	0.9%	1.3%														
<b>REGION 6</b>	<b>48,890</b>	<b>50,522</b>	<b>52,387</b>	<b>0.7%</b>	<b>0.7%</b>														
Baca	3,788	3,791	3,825	0.1%	0.2%														
Bent	6,499	6,696	6,881	0.6%	0.5%														
Crowley	5,823	6,139	6,509	1.1%	1.2%														
Kiowa	1,398	1,443	1,499	0.6%	0.8%														
Otero	18,831	19,533	20,322	0.7%	0.8%														
Prowers	12,551	12,920	13,351	0.6%	0.7%														
	08 099 0001 Lamar Power Plant																1		
	08 099 0002 Lamar – Municipal																1		
	08 099 0003 Lamar Port of Entry										1								

+ - indicates monitors that to be installed in 2011  
**C** - Collocated monitors  
**S** - SASS PM<sub>2.5</sub> monitor  
**E** – PM<sub>2.5</sub> carbon monitor  
**R** – PM<sub>10.2.5</sub> coarse monitor  
**WS** – Wind Speed

**WD** – Wind Direction  
**T** – Temperature  
**Rel. Hum.** – Relative Humidity  
**Precip** – Precipitation  
**Hi-Vol** – High Volume  
**Lo-Vol** – Low Volume

**Crs.** – Coarse  
**Cont.** – Continuous  
**FRM** – Federal Reference Method  
**Carb.** – Carbon  
**SASS** – Speciation Air Sampling System

## II. CO

In 2011, as in 2010, the APCD will operate nine CO monitors. Currently, the NAAQS for CO is a primary standard, with a concentration level not to exceed 9 parts per million (ppm) in an eight hour time period, or 35 ppm in a one hour period. There is no secondary standard for CO. CO levels have declined from a statewide maximum eight hour value of 48.1 ppm in 1973 to a value of 3.1 ppm in 2010. The level of the standard has not been exceeded since 1999. The CO monitors currently operated by the APCD are associated both with State Maintenance Plan requirements and CFR requirements.

### Larimer and Weld Counties

Larimer and Weld counties have a population of 552,455 (April 2010 census data), an increase of 27.8% since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a major source of CO. However, there are several small industries and manufacturing processes located within the two counties that may contribute to CO levels. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries.

In 2010 the highest eight hour CO concentration recorded at the Fort Collins-Mason monitor was 2.0 ppm, with a maximum one hour concentration of 2.9 ppm. At the Greeley-West Annex site the maximum eight hour concentration recorded was 2.5 ppm, with a maximum one hour concentration of 4.2 ppm. All of the values were well below the Federal NAAQS requirements.

The CO monitors in this area are:

08 069 1004 Fort Collins-Mason, 708 S. Mason St.  
08 123 0010 Greeley -West Annex, 905 10<sup>th</sup> Avenue

### Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are various industries and manufacturing processes located in the area.

The maximum eight hour and one hour concentrations recorded in 2010 for each CO monitoring site are listed in the table below.

**Table 3. 2010 Maximum CO Concentrations in Denver Area**

Site ID	Site Name	2010 Eight Hour Max (ppm)	2010 One Hour Max (ppm)
08 001 3001	Welby	1.8	2.3
08 013 0009	Longmont - Main	2.6	4.5
08 031 0002	Denver – CAMP	3.1	4.3
08 031 0019	Denver – Firehouse #6	2.7	3.4
08 031 0025	Denver – DMAS	N/A	N/A

It is important to note here that the Denver – DMAS site began CO monitoring in early 2011.

### **El Paso, Park & Teller Counties**

This area has a population of 661,819 according to the April 2010 census data. This is an increase of 19.9% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller and Park Counties. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 416,427 according to the April 2010 census data. This is an increase of 15.4% since the 2000 census.

In 2010 the highest eight hour CO concentration recorded at the Colorado Springs-Hwy 24 monitor was 2.3 ppm, with a maximum one hour concentration of 4.6 ppm.

The CO monitor in this area is:

08 041 0015 Colorado Springs – Hwy. 24, 690 W. Highway 24

### **Western Counties**

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). This is an increase of 20.3% over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to the April 2010 census data. Short-term special purpose monitoring for CO has been done in Summit County at Vail and near the oil shale projects of Rio Blanco County. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is an increase of 39.5% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

In 2010 the highest eight hour CO concentration recorded at the Grand Junction monitor was 1.2 ppm, with a maximum one hour concentration of 1.7 ppm.

The CO monitor in this area is:

08 077 0018 Grand Junction-Pitkin, 645¼ Pitkin Avenue

### **QA/QC Checks for CO Monitors**

The APCD staff performs three types of gaseous analyzer performance checks: precision checks, accuracy audits, and calibrations. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The APCD Quality Assurance staff conducts accuracy audits on all of the CO instruments at least twice per year. The APCD field staff conducts precision checks nominally once every two weeks, and calibrations once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

### **Planned Changes in CO Monitoring**

There are no planned changes for CO monitoring in 2011.

### III. O<sub>3</sub>

On March 12, 2008, the U.S. Environmental Protection Agency released a new level of the NAAQS for O<sub>3</sub>. The change in the level was from 0.08 ppm as an eight hour average to 0.075 ppm as an eight hour average. This made a significant change in the number of O<sub>3</sub> monitors that exceed the standard on an annual basis. The following locations had maximum eight hour average concentrations that were greater than or equal to 0.075 ppm in 2010: Highlands, Chatfield Res., Arvada, Rocky Flats – N, and Fort Collins – West.

The EPA is currently set to establish a new primary O<sub>3</sub> standard somewhere in the range of 0.060 to 0.070 ppm in August 2011. A new secondary standard in the range of 7 to 15 ppb-hours will also be set at that time as well. Based on the data collected during O<sub>3</sub> season in 2010 (March 1 through September 30), should the new primary standard be a design value of 0.060 ppm (three year average of the fourth maximum eight hour concentration), the calculated O<sub>3</sub> design values for every O<sub>3</sub> monitor operated by the APCD would exceed it. If set at 0.065 ppm, there would be only two monitors that would not equal or exceed it. There are two sites that have three year design values that exceed the current eight hour O<sub>3</sub> NAAQS standard of 0.075 ppm—Chatfield State Park (0.076 ppm) and Rocky Flats – North (0.078 ppm).

#### Larimer and Weld Counties

Larimer and Weld counties have a population of 552,455 (April 2010 census data), an increase of 27.8% since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a major precursor source of O<sub>3</sub>. However, there are several small industries and manufacturing processes located within the two counties that may contribute to those levels as well. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries.

The first and fourth maximum eight hour concentrations recorded in 2010 for each O<sub>3</sub> monitoring site in Larimer and Weld Counties are listed in the table below. Also listed are the three year design values (2008-2010) for each site with enough data available to calculate them.

**Table 4. 2010 Maximum O<sub>3</sub> Concentrations in Larimer and Weld Counties**

Site ID	Site Name	2010 1 <sup>st</sup> eight Hour Max (ppm)	2010 4 <sup>th</sup> eight Hour Max (ppm)	2008-2010 Design Value (ppm)
08 069 0011	Fort Collins – West	0.077	0.075	0.074
08 069 0012	Rist Canyon	0.074	0.071	---
08 069 1004	Fort Collins – Mason	0.068	0.066	0.065
08 123 0009	Greeley – Tower	0.078	0.073	0.071

#### Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are various industries and manufacturing processes located in the area. Only Adams, Arapahoe, Boulder, Douglas, Jefferson and Denver Counties have O<sub>3</sub> monitors.

The first and fourth maximum eight hour concentrations recorded in 2010 for each O<sub>3</sub> monitoring site in the metropolitan Denver area are listed in the table below. Also listed are the three year design values (2008-2010) for each site with enough data available to calculate them.

**Table 5. 2010 Maximum O<sub>3</sub> Concentrations in the Denver Metro Area**

Site ID	Site Name	2010 1 <sup>st</sup> Eight Hour Max (ppm)	2010 4 <sup>th</sup> Eight Hour Max (ppm)	2008-2010 Design Value (ppm)
08 001 3001	Welby	0.068	0.063	0.070
08 005 0002	Highland Reservoir	0.077	0.075	---
08 005 0006	Aurora – East	0.075	0.070	---
08 013 0011	South Boulder Creek	0.082	0.072	0.073
08 031 0014	Denver – Carriage	0.073	0.069	0.068
08 031 0025	Denver – DMAS	0.068	0.064	0.065
08 035 0004	Chatfield State Park	0.081	0.079	<b>0.076</b>
08 059 0002	Arvada	0.077	0.075	0.073
08 059 0005	Welch	0.076	0.072	0.071
08 059 0006	Rocky Flats – N	0.083	0.076	<b>0.078</b>
08 059 0011	NREL	0.079	0.074	0.072
08 059 0013	Aspen Park	0.080	0.073	---

### El Paso, Park & Teller Counties

This area has a population of 661,819 according to the April 2010 census data. This is an increase of 19.9% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller and Park Counties. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 416,427 according to the April 2010 census data. This is an increase of 15.4% since the 2000 census.

The first and fourth maximum eight hour concentrations recorded in 2010 for each O<sub>3</sub> monitoring site in El Paso, Park, and Teller Counties are listed in the table below. Also listed are the three year design values (2008-2010) for each site with enough data available to calculate them.

**Table 6. 2010 Maximum O<sub>3</sub> Concentrations in El Paso, Park and Teller Counties**

Site ID	Site Name	2010 1 <sup>st</sup> Eight Hour Max (ppm)	2010 4 <sup>th</sup> Eight Hour Max (ppm)	2008-2010 Design Value (ppm)
08 041 0013	U.S. Air Force Academy	0.080	0.068	0.066
08 041 0016	Manitou Springs	0.086	0.072	0.069

### Western Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). This is an increase of 20.3% over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to the April

2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is an increase of 39.5% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

The first and fourth maximum eight hour concentrations recorded in 2010 for each O<sub>3</sub> monitoring site in El Paso, Park, and Teller Counties are listed in the table below. Also listed are the three year design values (2008-2010) for each site with enough data available to calculate them.

**Table 7. 2010 Maximum O<sub>3</sub> Concentrations in the Western Counties**

<b>Site ID</b>	<b>Site Name</b>	<b>2010 1<sup>st</sup> Eight Hour Max (ppm)</b>	<b>2010 4<sup>th</sup> Eight Hour Max (ppm)</b>	<b>2008-2010 Design Value (ppm)</b>
08 045 0012	Rifle – Health	0.069	0.066	0.064
08 077 0020	Palisade Water Treatment	0.070	0.068	0.067
08 083 0006	Cortez	0.076	0.064	0.064

### **QA/QC Checks for O<sub>3</sub> Monitors**

The APCD staff performs three types of gaseous analyzer performance checks: precision checks, accuracy audits, and calibrations. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The APCD Quality Assurance staff conducts accuracy audits on all of the O<sub>3</sub> instruments at least twice per year. The APCD field staff conducts precision checks nominally once every two weeks, and calibrations once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

### **Planned Changes in O<sub>3</sub> Monitoring**

Planned changes for the 2011 / 2012 plan year include the review of sites in the Front Range for possible enhancement, and the possible installation of a new site in the Pueblo area to meet the impending new Federal monitoring requirements. Additionally, there are plans for a new O<sub>3</sub> site in northwest Colorado by Maybell to support the 3-State Pilot Study.

#### **IV. NO<sub>2</sub>/NO<sub>y</sub>**

The APCD has monitored NO<sub>2</sub> at eight locations in Colorado. All but two of these locations are no longer operating. Only the CAMP monitor has ever approached the annual average standard of 53 ppb. It recorded a 52 ppb yearly average in 1975, 1976, 1979, and in 1983. In the past 20 years the levels have been declining and in the past three years the levels have been reduced to less than one-half of the standard. In January 2010, the EPA set a new primary NAAQS that is a supplement to the annual average standard. The new one hour standard is set at a level of 100 ppb, and is based on "...the 3-year average of the 98<sup>th</sup> percentile of the yearly distribution of the one hour daily maximum concentrations..."<sup>4</sup>. The secondary standard is the same as the primary standard for this pollutant.

The APCD began monitoring for NO<sub>y</sub> at the NCore DMAS site in January 2011. NO<sub>y</sub> monitoring is a requirement for an NCore station, but as of yet there are no standards for NO<sub>y</sub>.

#### **Metropolitan Denver Counties**

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are various industries and manufacturing processes located in the area.

In 2010, the annual NO<sub>2</sub> concentration at the Welby site was 16 ppb. For 2008 through 2010 the one-hour standard design value is 61 ppb, which is well below the 100 ppb NAAQS. It is not possible to calculate the one-hour standard design value for 2010 at the CAMP site, as 75% of the required data for 2009 is not available due to quality assurance issues discovered in September of 2009. The 2010 annual average at CAMP was 28 ppb, which is also well below the standard. There are no reportable values for the DMAS site, as it began NO<sub>y</sub> monitoring in January 2011.

The NO<sub>2</sub>/NO<sub>y</sub> monitors in this area are:

08 001 3001 Welby, 3174 E. 78<sup>th</sup> Avenue  
08 031 0002 Denver-CAMP, 2105 Broadway  
08 031 0025 Denver-DMAS, 678 S, Jason Street

#### **QA/QC Checks for NO<sub>x</sub>/NO<sub>y</sub> Monitors**

The APCD staff performs three types of gaseous analyzer performance checks: precision checks, accuracy audits, and calibrations. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The APCD Quality Assurance staff conducts accuracy audits on all of the NO<sub>x</sub>/NO<sub>y</sub> instruments at least twice per year. The APCD field staff conducts precision checks nominally once every two weeks, and calibrations once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

---

<sup>4</sup>“Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule,” 75 Federal Register 26 (9 February 2010), pp. 6474 – 6536.



### **Planned Changes in NO<sub>2</sub>/NO<sub>y</sub> Monitoring**

There are no planned changes in the NO<sub>2</sub>/NO<sub>y</sub> monitoring network for 2011. However, APCD will begin site investigation for near-roadway monitors that are to be implemented by January 1, 2013. Based on the new monitoring rule requirements, APCD will need to install three new near-roadway NO<sub>2</sub> sites: two in Denver and one in Colorado Springs. Selection of these sites will be informed by work currently in progress nationwide with pilot sites, and with expected EPA guidance documents. Full descriptions of the new sites will be provided in the 2012-2013 Network Plan.

## V. SO<sub>2</sub>

The Air Pollution Control Division has monitored SO<sub>2</sub> at eight locations in Colorado. Currently, there are only three monitoring locations in operation. The primary NAAQS for SO<sub>2</sub> is an annual mean not to exceed 30 ppb, or 0.03 ppm, a 24-hour mean not to exceed 140 ppb, or 0.14 ppm, and a one hour average not to exceed 75 ppb. It should be noted here that by EPA convention the annual, 24-hour, and three hour standard design values are reported in ppm, while the one hour standard is reported in ppb. To be consistent, for this SO<sub>2</sub> section, all values discussed from this point forward will be in ppb units.

The one hour primary standard was finalized June 2, 2010. To attain that standard, the three year average of the 99<sup>th</sup> percentile of the daily maximum one hour average at each monitor within an area must not exceed 75 ppb. The secondary NAAQS is a three hour average not to exceed 500 ppb, or 0.5 ppm, more than once per year. SO<sub>2</sub> has never approached the level of any of the standards. Even in the mid-1970s when the levels were at their highest, they were generally less than one half of the level of the standards. The primary reason for these low levels is that what coal fired industry there is in Colorado uses low sulfur coal for combustion.

### Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are various industries and manufacturing processes located in the area.

There is no one hour standard design value for the CAMP site, as 75% of the data from 2009 is not available due to quality assurance issues discovered in September of 2009. It should be noted here that the one hour values are listed in ppb in accordance with the EPA's data reporting rules for this pollutant.

**Table 8. 2010 Maximum SO<sub>2</sub> Concentrations for the Denver Metro Area**

Site ID	Site Name	2010 Annual Avg. (ppb)	2010 24-Hour Max (ppb)	2010 One-Hour Max (ppb) <sup>5</sup>	2010 Three-Hour Max (ppb)
08 001 3001	Welby	1	10	33	30
08 031 0002	Denver - CAMP	2	10	N/A	20
08 031 0025	Denver – DMAS	N/A	N/A	N/A	N/A

### QA/QC Checks for SO<sub>2</sub> Monitors

The APCD staff performs three types of gaseous analyzer performance checks: precision checks, accuracy audits, and calibrations. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The APCD Quality Assurance staff conducts accuracy audits on all of the SO<sub>2</sub> instruments at least twice per year. The APCD field staff conducts precision checks nominally once every two weeks, and calibrations once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A

---

<sup>5</sup>The one hour SO<sub>2</sub> design value is calculated by taking the three year average of the 99<sup>th</sup> percentile of the daily maximum one hour averages.

complete description of the procedures and the results are available from the APCD.

### **Planned Changes in SO<sub>2</sub> Monitoring**

In 2011 there are no planned changes to the SO<sub>2</sub> monitoring network. However, APCD will begin site investigation for monitors that are to be implemented by January 1, 2013. Based on the new monitoring rule requirements, APCD will need to install two new SO<sub>2</sub> sites: one in Denver and one in Colorado Springs. It is possible that existing SO<sub>2</sub> monitoring sites may be able to meet the new monitoring rule requirements. Full descriptions of the new sites will be provided in the 2012-2013 Network Plan.

## VI. PM<sub>10</sub>

In 2010, the APCD operated 77 PM<sub>10</sub> monitors at 30 different locations. Of these monitors, 69 are high volume monitoring sites, five are low volume monitoring sites, three sites have continuous monitors collocated with FRM monitors and two sites have continuous coarse particulate monitors, which also monitor PM<sub>2.5</sub> and PM<sub>10</sub>. There are three sites with collocated high volume samplers (Denver CAMP, Denver DMAS and Crested Butte), and one site with collocated low volume samplers (Grand Junction - Powell). The PM<sub>10</sub> NAAQS is a 24-hour average of 150 µg/m<sup>3</sup> not to be exceeded more than an average of 1.0 times in a three year period. This average is also based on the monitoring frequency and the percent of valid data collected at a site.<sup>6</sup>

### Larimer and Weld Counties

Larimer and Weld counties have a population of 552,455 (April 2010 census data), an increase of 27.8% since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a source of particulate matter. Several industries and manufacturing processes located within the two counties also contribute to particulate levels. These industries include a brewery, power plants, cement plants, mining, electronics, film manufacturing facilities, and rock quarries. There are also a variety of agricultural sources of PM<sub>10</sub> including feed lots, grazing, tilling, and other agricultural activities.

Neither the monitor at the Fort Collins – CSU site nor the Greeley monitor had any PM<sub>10</sub> exceedance in 2010. The maximum concentrations recorded were 56 µg/m<sup>3</sup> at Fort Collins, and 44 µg/m<sup>3</sup> at Greeley.

The PM<sub>10</sub> monitoring sites in this area are:

08 069 0009 Fort Collins-CSU, 251 Edison Drive  
08 123 0006 Greeley-Hospital, 1516 Hospital Road

### Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are various industries and manufacturing processes located in the area.

There were no PM<sub>10</sub> exceedances by any of the monitors in the Denver Metro area. The table below lists the maximum concentrations recorded at each of the sites in 2010. Site ID numbers that include an asterisk (\*) indicate a low volume sampler, while no star indicates high volume samplers.

---

<sup>6</sup>“Appendix K to Part 50 – Interpretation of the National Ambient Air Quality Standards for Particulate Matter,” 40 Federal Regulations 50 (1 July 2010), pp. 80-83.

**Table 9. 2010 Maximum PM<sub>10</sub> Concentrations for the Denver Metro Area**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 001 0006*	Commerce City	72
08 001 3001	Welby	63
08 013 0003	Longmont-Municipal	36
08 013 0012	Boulder Chamber Bldg.	50
08 031 0002	Denver – CAMP	58
08 031 0017	Denver Visitor Center	62
08 031 0025	Denver – DMAS	56

### **Eastern Plains Counties**

This area includes Elbert and Prowers Counties. The population of the Elbert County area is 23,086 according to the 2010 census data. This is a 16.2% increase over the 2000 census data. The 2010 census population of Prowers County is 12,551, which is a decrease of 13.3% from the 2000 census data.

There were no PM<sub>10</sub> exceedances at the Lamar Power Plant site, or the Lamar Municipal site in 2010. The highest concentration recorded at the Lamar Power Plant site was 136 µg/m<sup>3</sup>, while that at the Lamar Municipal site was 95 µg/m<sup>3</sup>. Both samplers are high volume samplers.

The PM<sub>10</sub> monitoring sites in this area are:

08 099 0001 Lamar Power Plant, 100 N. 2<sup>nd</sup> St.

08 099 0002 Lamar Municipal, 104 E. Parmenter Street

The sources of PM<sub>10</sub> in the eastern plains are mainly agricultural with some mobile sources near cities and towns. Agricultural sources of PM<sub>10</sub> include feed lots, grazing, tilling, and other dry land agricultural activities. There is also a coal fired power plant in Lamar and a flour mill that contribute to PM<sub>10</sub> in Lamar.

### **Southern Front Range Counties**

This area has a population of 804,676 according to the April 2010 census data. This is an increase of 18.5% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller County. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 416,427 according to the April 2010 census. This is an increase of 15.4% since the 2000 census.

There were seven exceedances in this area in 2010, four at Alamosa – Adams State College, and three at Alamosa Municipal. The table below shows the maximum concentration values recorded at each site in 2010. Sites with a star (\*) after the site ID number indicate low volume samplers are in operation. No star indicates a high volume sampler.

The high values seen at the Alamosa sites are under consideration as exceptional events by the department, and are most likely due to strong wind gusts.

**Table 10. 2010 Maximum PM<sub>10</sub> Concentrations in the Southern Front Range Counties**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 003 0001	Alamosa – Adams State College	285
08 003 0003	Alamosa – Municipal	236
08 041 0017*	Colorado College	41
08 043 0003	Cañon City – City Hall	31
08 101 0015	Pueblo – Fountain School	59

**Mountain Counties**

The mountain counties consist of those counties generally along the Continental Divide. The monitoring sites are located mostly in small towns in tight mountain valleys. These communities range from Steamboat Springs in the north to Breckenridge in the I-70 corridor, as well as Aspen, Crested Butte and Mt. Crested Butte in the central mountains, and Pagosa Springs in the south.

The population of Pagosa Springs is 1,727 people (April 2010 census data). This is an increase of 8.6% from the 2000 census. The Crested Butte and Mt. Crested Butte area population is 2,288 (2010 census), which is a decrease of 2.3% from the 2000 census. The Aspen 2010 population is 6,658 people, an increase of 12.6% from the 2000 census. The Steamboat Springs 2010 population is 12,088, an increase of 23.2% over the 2000 census population. The Breckenridge 2010 population is 4,540, which is an increase of 88.5% from the 2000 census numbers.

There were seven PM<sub>10</sub> exceedances in the mountain counties, five of which were at the Pagosa Springs monitoring location, and one each at the Crested Butte and Mt. Crested Butte locations. The table below lists the maximum concentrations recorded at each of the sites in 2010.

**Table 11. 2010 Maximum PM<sub>10</sub> Concentrations for the Mountain Counties**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 007 0001	Pagosa Springs	349
08 051 0004	Crested Butte	174
08 051 0007	Mount Crested Butte	168
08 097 0006	Aspen – Library	70
08 107 0003	Steamboat Springs	99
08 117 0002	Breckenridge	80

**Western Counties**

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). This is an increase of 20.3% over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to the April 2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is an increase of 39.5% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

There were five PM<sub>10</sub> exceedances in the western counties in 2010, two at the Durango site, one in Grand Junction, one in Clifton, and one in Telluride. The table below lists the maximum concentrations recorded at the monitoring sites in this area. Site ID numbers that include a star (\*) indicate a low volume sampler, while no star indicates high volume samplers. Sources of PM<sub>10</sub> in the Western region include: motor vehicle activity, industries and manufacturing processes, which include lumber processing, mining, gravel pits, and rock quarries. There are also a variety of agricultural sources of PM<sub>10</sub> including feed lots, grazing, tilling, and other dry land agricultural activities.

**Table 12. 2010 Maximum PM<sub>10</sub> Concentrations in the Western Counties Area**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 029 0004	Delta	125
08 045 0005	Parachute	125
08 045 0007	Rifle – Henry Building	59
08 067 0004	Durango – River City Hall	320
08 077 0017*	Grand Junction – Powell	155
08 077 0019	Clifton	189
08 113 0004	Telluride	354

**Quality Assurance Checks for PM<sub>10</sub> Monitors**

The audit checks performed on the particulate monitors consist of calibrated flow checks. The precision checks that are made on particulate monitors consist of collocated samplers that operate side-by-side on the same operating schedule. The samples are then compared to ensure that the data are within federal limits. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

**Planned Changes in PM<sub>10</sub> Monitoring**

The Lamar Power Plant monitor will be considered for removal in 2011 because it is no longer located in ambient air.

## VII. PM<sub>2.5</sub>

PM<sub>2.5</sub> concentration values are reported in three different groups of readings by the APCD. The first group of readings is reported as the Federal Reference Method (FRM-88101) concentrations, while the second group is reported as Total Atmospheric PM<sub>2.5</sub> (TEOM with FDMS-88500), and the final group is reported as Raw Data (TEOM without FDMS-88501). In 2010, the APCD operated 36 PM<sub>2.5</sub> monitors at 19 different locations throughout the state. There are two sites with collocated FRM monitors and eight sites with an FRM monitor plus either a total atmospheric or a raw data monitor. There are three carbon monitors and three SASS monitors, in addition to the twelve continuous and eighteen FRM monitors.

The primary PM<sub>2.5</sub> NAAQS are 15.0 µg/m<sup>3</sup> annually (averaged over a three year period) and 35 µg/m<sup>3</sup> in a 24-hour period. The 24-hour standard was lowered on September 20, 2006.

### Larimer and Weld Counties

Larimer and Weld counties have a population of 552,455 (April 2010 census data), an increase of 27.8% since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a source of particulate matter. There are also several small industries and manufacturing processes located within the two counties that may contribute to particulate levels. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries. The PM<sub>2.5</sub> sites listed below with manual method FRM sites in the APCD network as of December 31, 2010, are suitable for comparisons to the annual PM<sub>2.5</sub> NAAQS.

There were no PM<sub>2.5</sub> exceedances in 2010 in the Larimer and Weld County area. The table below lists the maximum PM<sub>2.5</sub> concentrations recorded at each of the sites in Larimer and Weld Counties. The monitoring data listed below are all from FRM monitors.

**Table 13. 2010 Maximum PM<sub>2.5</sub> Concentrations in Larimer and Weld Counties**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 069 0009	Fort Collins – CSU	27.7
08 123 0006	Greeley – Hospital	33.2
08 123 0008	Platteville	26.5

### Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are various industries and manufacturing processes located in the area.

There was one exceedance of the PM<sub>2.5</sub> standard in the Denver Metro area in 2010. It was at the Boulder Chamber of Commerce Building. This exceedance was caused by a wildfire and is being documented as an uncontrollable natural event under the Exceptional Event Rule. The table below lists the maximum PM<sub>2.5</sub> concentrations recorded in 2010 for each site in the Denver Metro area. All the monitoring data listed in the table are from FRM monitors.



**Table 14. 2010 Maximum PM<sub>2.5</sub> Concentrations in the Denver Metro Area**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 001 0006	Commerce City	25.4
08 005 0005	Arapahoe Community College	22.2
08 013 0003	Longmont – Municipal	27.2
08 013 0012	Boulder Chamber of Commerce	44.7
08 031 0002	Denver – CAMP	26.0
08 031 0023	Denver – Swansea	23.2
08 031 0025	Denver – DMAS	24.8
08 035 0004	Chatfield Reservoir	19.4

The following sites are micro-scale sites and are EPA approved. Also, the Denver CAMP site has been determined by an extensive analysis by the Division in 2001 to be representative of the neighborhood scale. This is essentially because there are several contiguous micro-scale sites with similar emissions, meteorology and land uses in the area of downtown Denver.

- 08 031 0002-1 Denver CAMP, 2105 Broadway
- 08 031 0023-1 Denver Swansea, 4650 Columbine Street
- 08 031 0025-1 Denver Animal Shelter, 678 S. Jason Street
- 08 035 0004-1 Chatfield Reservoir, 11500 N. Roxborough Park Road

The Boulder Chamber of Commerce building site is considered a middle scale site, but it has been approved by the EPA as representative of a neighborhood scale site. The Division performed a land use and gridded emissions inventory analysis to demonstrate to EPA that the area surrounding the Boulder Chamber of Commerce building has many contiguous middle scale sites with similar emissions densities, meteorology and land uses.

### **El Paso, Park, Pueblo, Elbert & Teller Counties**

This area has a population of 843,968 according to the April 2010 census data. This is an increase of 18.3% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller and Park Counties. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 416,427 according to the April 2010 census. This is an increase of 15.4% since the 2000 census.

There were no exceedances of the PM<sub>2.5</sub> NAAQS standard in the El Paso, Park, Pueblo, Elbert and Teller County area in 2010. The table below lists the maximum recorded PM<sub>2.5</sub> values recorded in 2010. All monitoring data listed here are from FRM monitors. It should be noted that the Elbert County monitor, which measures background PM<sub>2.5</sub> concentrations, is no longer in operation as of 5/1/2011. The Division is searching for a suitable replacement site.

**Table 15. 2010 Max PM<sub>2.5</sub> Concentrations in the Southern Front Range Counties**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 039 0001	Elbert County	13.4
08 041 0017	Colorado College	14.9
08 101 0015	Pueblo – Fountain School	19.3

## Western Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). This is an increase of 20.3% over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to April 2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is an increase of 39.5% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

There were three PM<sub>2.5</sub> exceedances recorded in the western counties area. All three were monitored at the Grand Junction – Powell site and were due to a persistent temperature inversion in January 2010. The table below lists the maximum PM<sub>2.5</sub> concentrations recorded in 2010 for each site.

**Table 16. 2010 Maximum PM<sub>2.5</sub> Concentrations in the Western Counties**

Site ID	Site Name	Max. 24-Hour Concentration (µg/m <sup>3</sup> )
08 077 0017	Grand Junction – Powell	43.3
08 083 0006	Cortez	13.8

### PM<sub>2.5</sub>, TEOM, and BAM Continuous Monitors not Intended for NAAQS Comparison

All Federal Reference Method (FRM) monitors in the Colorado PM<sub>2.5</sub> network can be and are compared to the NAAQS. The FRM monitors are all filter based 24-hour composite samples. The Division also employs three models of the TEOM (tapered element oscillating microbalance) continuous monitors in the Colorado network, two of which are designated as Federal Equivalent Method (FEM) monitors. One does not have federal equivalency. The three TEOM models are:

- TEOM 1400a (not an FEM)
- TEOM 1400a with 8500 FDMS (Filter Dynamic Measurement System) is an FEM
- TEOM 1401DF, a dichotomous monitor that captures both PM<sub>2.5</sub> (fine particles) and PM<sub>10-2.5</sub> (coarse particles) and adds those two parameters to calculate PM<sub>10</sub> concentrations and uses an FDMS is a FEM.

These monitors are used to gather near real-time data that are mainly used to inform and alert the public when concentrations are elevated and for short term forecasting of air pollution by the Division. Although, the TEOM 1400 AB with 8500 FDMS, and the TEOM 1400DF are federally equivalent monitors the Division has chosen to not use these monitors for regulatory purposes due to frequent problems with the monitors. The following sites have continuous PM<sub>2.5</sub> monitors that are not intended for comparison with the NAAQS:

08 001 0006-3 Commerce City, 7101 Birch Street  
08 013 0003-3 Longmont-Municipal, 350 Kimbark Street  
08 013 1001-3 Boulder CU/Athens, 2102 Athens St.  
08 031 0002-3 Denver-CAMP, 2105 Broadway  
08 031 0013-3 Denver NJH-E, 14<sup>th</sup> Avenue and Albion Street  
08 031 0025-3 Denver Municipal Animal Shelter, 678 S. Jason Street

08 035 0004-3 Chatfield Reservoir, 11500 N. Roxborough Park Road  
08 041 0017-3 Colorado College, 130 W. Cache la Poudre  
08 045 0007-3 Rifle – Henry Building, 144 3<sup>rd</sup> Street  
08 069 0009-3 Fort Collins-CSU, 251 Edison Drive  
08 077 0017-3 Grand Junction-Powell, 650 South Avenue  
08 123 0006-3 Greeley-Hospital, 1516 Hospital Road

### **Community Monitoring Zones**

Community monitoring zones are an additional method of defining an area for comparison with the PM<sub>2.5</sub> NAAQS where data from two or more monitoring sites are averaged together for comparison with the standard. Currently, the APCD does not have any areas where this technique is used.

The definition of community monitoring zone (CMZ) in 40 CFR Part 58.1 is as follows: “Community monitoring zone (CMZ) means an optional averaging area with established, well defined boundaries, such as county or census block, within a Monitoring Planning Area (MPA) that has relatively uniform concentrations of annual PM<sub>2.5</sub> as defined by appendix N of part 50 of this chapter. Two or more community oriented SLAMS monitors within a CMZ that meet certain requirements as set forth in appendix N of part 50 of this chapter may be averaged for making comparisons to the annual PM<sub>2.5</sub> NAAQS.” The CMZ is an optional technique that averages the PM<sub>2.5</sub> 24-hour concentrations from two or more monitors located in the same community.

If the PM<sub>2.5</sub> monitoring network is changed by the creation/change of a CMZ or changing the location of a violating monitor, then the APCD will ask EPA Region VIII for approval via the current network modification process, and then notify the appropriate governments of affected communities. The APCD will also provide the proposed changes to the affected communities and concerned citizens on our web site. A public comment period will be open for thirty (30) days prior to the APCD selecting a new site. Many times the APCD has no control over a site closure. For example, a site is closed due to the planned demolition of the building that hosts the monitor. In such cases a new site must be found. The PM<sub>2.5</sub> instruments may be moved to a temporary site and monitoring resumed. However, the final site selection will go through the public vetting process to locate the best possible site.

### **Quality Assurance Checks for PM<sub>2.5</sub> Monitors**

The audit checks performed on the particulate monitors consist of calibrated flow checks. The precision checks that are made on particulate monitors consist of collocated samplers that operate side-by-side and collect a sample from both samplers once every sixth day. EPA requires a minimum of 15% of the FRM network to be collocated. Colorado has 16 FRM monitoring sites and, two sites are collocated (CAMP, Commerce City). The EPA also has a performance evaluation program (PEP), which checks the national network for bias by having a private contractor set up an independent FRM sampler next to the Division’s PM<sub>2.5</sub> sampler (between 1 – 4 m apart). Once each calendar quarter a collocated sample from 25 % of the network is sent to a private laboratory (RTI) to compare results and check for bias. All of the samples are then compared to ensure that the data are within federal limits and meet pre-established data quality objectives. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

### **Planned Changes in PM<sub>2.5</sub> Monitoring**

Possible relocation of Boulder CU/Athens TEOM site in 2011 due to new construction near the site. The Elbert background site was unexpectedly terminated due to a change in property ownership and the new owner does not want to continue monitoring on his property. The Division is currently searching for a new PM<sub>2.5</sub> background site.

## VIII. TSP/Pb

In December 2006 Total Suspended Particulate (TSP) monitoring by the APCD was reduced from six monitoring sites to a single site at the Denver Municipal Animal Shelter. TSP is monitored only as a first step in ambient lead analysis. In the past three years the maximum quarterly lead concentration has generally been less than a tenth of the standard. In addition, Colorado has not recorded an exceedance of the previous lead standard ( $1.5 \mu\text{g}/\text{m}^3$  averaged over a calendar quarter) since the first quarter of 1980. The new lead standard, which is  $0.15 \mu\text{g}/\text{m}^3$  averaged over any three rolling consecutive three-month periods, has not been exceeded using data from 2008 – 2010. The new lead standard became effective on December 15, 2008.

With the revision of the standard in mind, the APCD reviewed its stationary sources database for all point sources that emit lead in Colorado. There were 32 lead sources identified in a database retrieval conducted in November, 2008. None of the sources emit greater than one ton(s) per year (TPY) of total lead, which includes elemental lead and all lead compounds. Thus, no new lead monitors are required at any point source facility in Colorado.

The U.S. EPA calculated emissions for lead at general aviation airports due to piston engine aircraft, which continue to use leaded aviation fuel. According to EPA, Centennial Airport had the second highest lead emissions of any airport in the country at 1.18 TPY using data from the 2005 National Emissions Inventory (NEI). Since this emissions estimate exceeded the threshold for lead, the Division has located a lead sampling site at the Centennial Airport. This monitoring site was installed in March 2010 and the first sample was collected on April 3, 2010. Subsequently, EPA has updated the lead emissions inventory for airports using 2008 NEI data. They found that Centennial Airport has dropped to the sixth highest lead emissions of any airport in the country at 1.08 TPY. The decrease in general aviation activity is likely due to the economic recession. Also, the EPA has lowered the lead emissions threshold from 1.0 TPY to 0.5 TPY. Colorado still has no lead point sources greater than 0.5 TPY. However, the APCD may need to monitor lead at three additional airports, including: Pueblo Memorial (0.55 TPY, ranked 47<sup>th</sup>), Greeley-Weld County (0.54 TPY, ranked 51<sup>st</sup>), and Rocky Mountain Metropolitan Airport in Jefferson County (0.51 TPY, ranked 59<sup>th</sup>). This new monitoring is on hold pending an airport lead study being conducted by EPA.

### Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,798,757 (April 2010 census data). This is an increase of 15.9% from the 2000 census. There are numerous industries and manufacturing processes located in the area, but only a very few emit significant amounts of lead into the air.

There were no exceedances of the lead NAAQS in 2010. The maximum TSP value recorded by both the primary and secondary DMAS TSP monitors in 2010 was  $107 \mu\text{g}/\text{m}^3$ . The maximum lead value recorded by the DMAS primary lead monitor in 2010 was  $0.020 \mu\text{g}/\text{m}^3$ , while that recorded by the collocated lead monitor was  $0.022 \mu\text{g}/\text{m}^3$ . The maximum TSP value recorded by the Centennial TSP monitor in 2010 was  $66 \mu\text{g}/\text{m}^3$ . The maximum lead value recorded by the Centennial lead monitor in 2010 was  $0.038 \mu\text{g}/\text{m}^3$ .

The TSP/Lead monitoring sites in this area include:

08 031 0025 Denver Municipal Animal Shelter, 678 S. Jason Street

08 005 0007 Centennial Airport, near 7800 S. Peoria Street (adjacent to Runway 10 near the taxiway and take-off zone)

### **Quality Assurance Checks for TSP/Pb Monitors**

The audit checks performed on the particulate monitors consist of calibrated flow checks. The precision checks that are made on particulate monitors consist of collocated samplers that operate side-by-side on the same operating schedule. Once each calendar quarter a collocated sample is sent to the EPA Region 9 lab as part of the lead performance evaluation program (Pb-PEP), which checks the national network for bias. The samples are then compared to ensure that the data are within federal limits and meet pre-established data quality objectives. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

### **Planned Changes in TSP and Lead Monitoring**

There are no planned changes to the TSP/Pb monitoring program in 2011.

## **IX. METEOROLOGICAL MEASUREMENTS**

Meteorological measurements taken by the APCD consist of Wind Speed, Wind Direction, Temperature and Humidity. The wind speed and direction measurements are made as both scalar and vector averages. A final parameter that is recorded at the meteorological sites is the standard deviation of horizontal wind direction. This is a calculation, not a direct measurement, of the variation of wind direction over time.

The meteorological monitoring sites are:

08 001 0006 Commerce City, 7101 Birch Street  
08 001 3001 Welby, 3174 E. 78<sup>th</sup> Avenue  
08 005 0002 Highland Reservoir, 8100 S. University Boulevard  
08 005 0006 Aurora-East, 36001 Quincy Avenue  
08 031 0002 Denver-CAMP, 2105 Broadway  
08 031 0014 Denver-Carriage, 2325 Irving Street  
08 031 0025 Denver Municipal Animal Shelter, 678 S. Jason Street  
08 035 0004 Chatfield State Park, 11500 N. Roxborough Park Road  
08 045 0005 Parachute – Elem. School, 100 E. 2<sup>nd</sup> Street  
08 045 0012 Rifle Health Dept., 195 W. 14<sup>th</sup> Street  
08 059 0002 Arvada, 9101 W. 57<sup>th</sup> Avenue  
08 059 0005 Welch, 12400 W. Hwy 285  
08 059 0006 Rocky Flats-N, 16600 W. Hwy 128  
08 059 0008 Rocky Flats-SE, 9901 Indiana Street  
08 059 0013 Aspen Park, 26137 Conifer Road  
08 069 0012 Rist Canyon, 11838 Rist Canyon Road  
08 069 1004 Fort Collins-Mason, 708 S. Mason Street  
08 077 0018 Grand Junction-Pitkin, 645 ¼ Pitkin Avenue  
08 077 0020 Palisade Water Treatment, Hwy 141 and D Road  
08 099 0003 Lamar Port of Entry, 7100 US Hwy 50

### **Planned Changes in Meteorological Monitoring for 2011/2012**

The Rocky Flats SE site will be eliminated at the end of 2011. New sensors will be installed at the Greeley-Weld County Tower site. Additional sensors may be installed at the Denver Municipal Animal Shelter site.

## Appendix A - Monitoring Site Descriptions

This Appendix includes site information for all sites containing continuous gaseous monitors, meteorological monitors, or particulate monitors. The data is presented first in a tabular format, and is then followed by site descriptions. It is in the order of AQS ID number.

**Table 17. Monitoring Site Locations and Instruments**

<i>AQS #</i>	<i>Site Name</i>	<i>CO</i>	<i>O<sub>3</sub></i>	<i>NO</i>	<i>NO<sub>2</sub></i>	<i>NO<sub>y</sub></i>	<i>SO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>PM<sub>2.5</sub></i>	<i>TSP/Pb</i>	<i>Met</i>
08 001 0006	Alsup Elementary School - Commerce City							X	X		X
08 001 3001	Welby	X	X	X	X		X	X			X
08 003 0001	Alamosa – Adams State Coll.							X			
08 003 0003	Alamosa – Municipal Bldg.							X			
08 005 0002	Highland Reservoir		X								X
08 005 0005	Arapaho Comm. Coll.								X		
08 005 0006	Aurora – East		X								X
08 005 0007	Centennial Airport									X	
08 007 0001	Pagosa Springs School							X			
08 013 0003	Longmont-Municipal Bldg.							X	X		
08 013 0009	Longmont - Main	X									
08 013 0011	South Boulder Creek		X								
08 013 0012	Boulder Chamber of Commerce							X	X		
08 013 1001	Boulder – CU - Athens								X		
08 029 0004	Delta Health Dept							X			
08 031 0002	Denver – CAMP	X		X	X		X	X	X		X
08 031 0013	Denver - NJH-E								X		
08 031 0014	Denver - Carriage		X								X
08 031 0017	Denver Visitor Center							X			
08 031 0019	Denver - Firehouse #6	X									
08 031 0023	Denver – Swansea Elem.								X		
08 031 0025	Denver Municipal Animal Shelter	X	X			X	X	X	X	X	X
08 035 0004	Chatfield State Park		X						X		X
08 041 0013	U. S. Air Force Academy		X								
08 041 0015	Colorado Springs Hwy. 24	X									X
08 041 0016	Manitou Springs		X								
08 041 0017	Colorado Springs Colorado College							X	X		
08 043 0003	Cañon City – City Hall							X			
08 045 0005	Parachute – Elem. School							X			X
08 045 0007	Rifle – Henry Bldg							X	X		X
08 045 0012	Rifle – Health Dept		X								
08 051 0004	Crested Butte							X			
08 051 0007	Mt. Crested Butte - Realty							X			



<i>AQS #</i>	<i>Site Name</i>	<i>CO</i>	<i>O<sub>3</sub></i>	<i>NO</i>	<i>NO<sub>2</sub></i>	<i>NO<sub>y</sub></i>	<i>SO<sub>2</sub></i>	<i>PM<sub>10</sub></i>	<i>PM<sub>2.5</sub></i>	<i>TSP/Pb</i>	<i>Met</i>
08 059 0002	Arvada		X								X
08 059 0005	Welch		X								X
08 059 0006	Rocky Flats - N		X								X
08 059 0008	Rocky Flats - SE										X
08 059 0011	NREL		X								
08 059 0013	Aspen Park		X								X
08 067 0004	Durango-River City Hall							X			
08 069 0009	Fort Collins – CSU - Edison							X	X		
08 069 0011	Fort Collins - West		X								
08 069 0012	Rist Canyon		X								X
08 069 1004	Fort Collins - Mason	X	X								X
08 077 0017	Grand Junction – Powell Bldg							X	X		
08 077 0018	Grand Junction - Pitkin	X							X		X
08 077 0019	Clifton - Sanitation							X			
08 077 0020	Palisade Water Treatment		X								X
08 083 0006	Cortez – Health Dept		X						X		
08 097 0006	Aspen - Library							X			
08 099 0001	Lamar Power Plant							X			
08 099 0002	Lamar Municipal							X			
08 099 0003	Lamar Port of Entry										X
08 101 0015	Pueblo - Fountain School							X	X		
08 107 0003	Steamboat Springs							X			
08 113 0004	Telluride							X			
08 117 0002	Breckenridge							X			
08 123 0006	Greeley-Hospital							X	X		
08 123 0008	Platteville Middle School								X		
08 123 0009	Greeley –County Tower		X								X
08 123 0010	Greeley – West Annex	X									

**Alsup Elementary School - Commerce City, 7101 Birch Street (08 001 0006):**

The Alsup Elementary School - Commerce City site is in a predominantly residential area with a large commercial and industrial district. It is located north of the Denver Central Business District (CBD) near the Platte River Valley, downstream from the Denver urban air mass. There are two schools in addition to the Alsup Elementary School in the immediate vicinity, a middle school to the north and a high school to the southeast. There is a large industrial area to the south and east and gravel pits about a kilometer to the west and northwest.

PM<sub>10</sub> monitoring began in January 2001 and continues today. The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 72 µg/m<sup>3</sup>. There were no exceedances of the PM<sub>10</sub> NAAQS at this site in 2010.

PM<sub>2.5</sub> monitoring began in January 2001 and continues today. There are a collocated set of monitors, along with a continuous monitor, a trends speciation monitor, and a PM<sub>2.5</sub> carbon

monitor all in operation. The maximum concentration recorded was 25.4  $\mu\text{g}/\text{m}^3$ .

Meteorological monitoring began in June of 2003.

**Welby, 3174 E. 78<sup>th</sup> Avenue (08 001 3001):**

Located 8 miles north-northeast of the Denver Central Business District (CBD) on the bank of the South Platte River, this site is ideally located to measure nighttime drainage of the air mass from the Denver metropolitan area and the thermally driven, daytime upriver flows. The monitoring shows that high CO levels are associated with winds from the south-southwest. While this is the direction of five of the six major sources in the area, it is also the direction of the primary drainage winds along the South Platte River. This monitor is in the SLAMS network, and is population oriented for a neighborhood scale.

CO monitoring began in 1973 and continued through the spring of 1980. Monitoring was stopped from the spring of 1980 until October 1986 when it began again as a special study. Welby has not recorded an exceedance of either the one-hour or eight-hour CO standard since January 1988. In the last few years, its primary value has been as an indicator of changes in the air quality index (AQI). The eight hour maximum value recorded in 2010 was 1.8 ppm, while the one-hour maximum value was 2.3 ppm.

O<sub>3</sub> monitoring began at Welby in July of 1973. The Welby monitor has not recorded an exceedance of the old one-hour O<sub>3</sub> standard since 1998. However, the trend in the 3-year average of the 4<sup>th</sup> maximum eight hour average has been increasing since 2002. The first maximum eight hour O<sub>3</sub> concentration recorded at this site in 2010 was 0.068 ppm. The three year average of the 4<sup>th</sup> highest eight hour average value for this site from 2008 through 2010 is 0.070 ppm, which is only slightly less than the standard value of 0.075 ppm. When the standard is lowered in August 2011, this site may exceed it.

The Welby NO<sub>2</sub> monitor began operation in July 1976. The site's location provides an indication of possible exceedance events before they hit the Denver-Metro area. The site serves as a good drainage location, but it may be a target for deletion or relocation farther down the South Platte River Valley from Denver. The annual average NO<sub>2</sub> concentration for this site was 16 ppb in 2010, which is well below the standard of 53 ppb.

The Welby SO<sub>2</sub> monitor began operation in July of 1973. The maximum 24-hour concentration recorded here was 10 ppb in 2010. The annual average was 1 ppb, the maximum one hour average was 30 ppb, and the maximum 3-hour average was 30 ppb. All values were well below the SO<sub>2</sub> standards of 140 ppb (24-hour max), 30 ppb (annual avg.), 75 ppb (one hour) and 500 ppb (3-hour max).

PM<sub>10</sub> monitoring began at Welby in June and July of 1990. The continuous monitor began operation in June, while the high volume monitor began operation in July. The maximum PM<sub>10</sub> concentration recorded by the high volume sampler in 2010 was 57  $\mu\text{g}/\text{m}^3$ , and that recorded by the continuous monitor was 63  $\mu\text{g}/\text{m}^3$ .

Meteorological monitoring began in January of 1975.

**Alamosa – Adams State College, 208 Edgemont Boulevard (08 003 0001):**

This Alamosa – Adams State College site is located on the science building of Adams State College in a principally residential area. The only significant traffic is on US 160 through the

center of town. The site is adjacent to this highway but far enough away to reduce direct impacts on the PM<sub>10</sub> levels. Meteorological data are not available from the area. The city has a population of 8,458 (July 2007 population estimate). This is an increase of 6.2% from the 2000 census. The major particulate source is wind-blown dust. This site began operation in 1973 as a TSP monitor and was changed to a PM<sub>10</sub> monitor in June 1990. This is a population oriented neighborhood scale SLAMS monitor that is on a daily sampling schedule. The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 285 µg/m<sup>3</sup>, which was an exceedance of the NAAQS, but was caused by a natural event (high winds/blowing dust), which may be excluded under the exceptional event rule. There were four exceedances recorded at this site in 2010. All are being documented as exceptional events.

**Alamosa - Municipal, 425 4<sup>th</sup> Street (08 003 0003):**

The Alamosa 425 4<sup>th</sup> Street was started in May 2002. The site was established closer to the center of the city to be more representative of the population exposure in the area. This is a population oriented neighborhood scale SLAMS monitor that is on a daily sample schedule. The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 236 µg/m<sup>3</sup>, which was an exceedance of the NAAQS, but was caused by a natural event (high winds/blowing dust), which may be excluded under the exceptional event rule. There were three exceedances recorded at this site in 2010. All are being documented as exceptional events.

**Highland Reservoir, 8100 S. University Boulevard (08 005 0002):**

The Highlands site began operation in June of 1978. It was intended to be a background location. However, with urban growth and the construction of C-470, it has become a long-term trend site that monitors changes in the air quality of the area. It is currently believed to be near the southern edge of the O<sub>3</sub> “cloud,” although it may not be in the area of maximum concentrations. This is a population oriented neighborhood scale SLAMS monitor. The first maximum eight hour O<sub>3</sub> concentration recorded at this site in 2010 was 0.077 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration from 2008 through 2010 cannot be calculated for this site yet, as there was not enough data available in 2008 due to the site being shut down for reconstruction of other facilities at the location. In addition, the site was shut down for a short time in 2010 to relocate the sampling trailer 25 meters to the east of its previous location. This was done to allow for the construction/installation of a back-up generator by the land owners.

Meteorological monitoring began in July of 1978.

**Arapahoe Community College (ACC), 6190 S. Santa Fe Drive (08 005 0005):**

The ACC site is located in south suburban metropolitan Denver. It is located on the south side of the Arapahoe Community College in a distant parking lot. The site is near the bottom of the Platte River Valley along Santa Fe Drive (Hwy. 85) in the city of Littleton. It is also near the city of Englewood. There is a large residential area located to the east across the railroad and Light Rail tracks. The PM<sub>2.5</sub> monitor is located on a mobile shelter in the rarely used South parking lot. Located at 6190 S. Santa Fe Drive, this small trailer is close to the Platte River and the monitor has excellent 360<sup>0</sup> exposure. Based on the topography and meteorology of the area ACC is in an area where PM<sub>2.5</sub> emissions may collect. This location may capture high concentrations during periods of upslope flow and temperature inversion in the valley. However, since it is further south in a more sparsely populated area than the Broadway-CAMP site, the concentrations are usually not as high as other Denver locations.

Winds are predominately out of the south-southwest and south, with secondary winds out of the north and north-northeast (upslope). Observed distances and traffic estimates easily fall into the neighborhood scale in accordance with federal guidelines found in the 40 CFR, Part 58, Appendix D. The site meets all other neighborhood scale criteria, making the monitor a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

The maximum PM<sub>2.5</sub> value recorded at this site in 2010 was 22.2 µg/m<sup>3</sup>, which is not an exceedance of the NAAQS.

**Aurora – East, 36001 Quincy Ave (08 005 0006):**

The Aurora East site began operation in June 2009. It is intended to act as a regional site and an aid in the determination of the easternmost extent of the O<sub>3</sub> “cloud” in the metro area. It is located along the eastern edge of the former Lowry bombing range, on a flat, grassy plains area. This site is currently outside of the rapid urban growth area taking place around Aurora Reservoir. There are currently plans to begin developing the Lowry area in the near future, however, which would shift the focus of this site from being a regional site to a neighborhood scale site. This is a special projects monitor (SPM) for a regional scale. The first maximum eight hour average recorded at this site in 2010 was 0.075 ppm. The 3-year average of the 4<sup>th</sup> highest O<sub>3</sub> concentration for 2007 through 2010 cannot be calculated at this time since the site began operation in 2009.

**Centennial Airport, 7800 S. Peoria Street (08 005 0007):**

The Centennial Airport site was established in April of 2010 in response to the tightening of the lead standards by the EPA. The maximum TSP concentration recorded at this site in 2010 was 66 µg/m<sup>3</sup>. There is no NAAQS for TSP. The maximum lead concentration recorded was 0.038 µg/m<sup>3</sup>, which is well below the lead standard.

**Pagosa Springs School, 309 Lewis Street (08 007 0001):**

The Pagosa Springs School site was located on the roof of the Town Hall from April 24, 2000 through May 2001. When the Town Hall building was planned to be demolished, the PM<sub>10</sub> monitor was relocated to the Pagosa Springs Middle School and the first sample was collected on June 7, 2001.

The Pagosa Springs School site is located next to Highway 160 near the center of town. Pagosa Springs is a small town spread over a large area. The San Juan River runs through the south side of town. The town sits in a small bowl like setting with hills all around. A small commercial strip area along Highway 160 and single-family homes surrounds this location. It is representative of residential neighborhood exposure. Pagosa Springs was a PM<sub>10</sub> nonattainment area and a SIP was implemented for this area. PM<sub>10</sub> concentrations were exceeded a few times in the late 1990s. In 2010 there were five exceedances recorded by this monitor. The highest PM<sub>10</sub> concentration recorded at this site in 2010 was 349 µg/m<sup>3</sup>, which is well above the standard of 150 µg/m<sup>3</sup>, but was caused by a natural event (high winds/blowing dust), which may be excluded under the exceptional event rule. There were five PM<sub>10</sub> exceedances recorded at this site in 2010. All are being documented as exceptional events due to high winds/blowing dust.

Winds for this area predominantly blow from the north, with secondary winds from the north-northwest and the south. The predominant wind directions closely follow the valley topography in this rugged terrain. McCabe Creek, which is very near the meteorological station that was on

the Town Hall building, runs north-south through this area. However, the highest wind gusts come from the west and southwest during region dust storms. This is a population oriented neighborhood scale SLAMS monitor on a daily sampling schedule.

**Longmont – Municipal Bldg., 350 Kimbark Street (08 013 0003):**

The town of Longmont is a growing, medium sized; Front Range community Longmont is located between the Denver/Boulder Metro-area and Fort Collins. Longmont is both suburban and rural in nature. The town of Longmont is located approximately 30 miles north of Denver along the St. Vrain Creek and is about six miles east of the foothills. Longmont is partly a bedroom community for the Denver-Boulder area. The elevation is 4978 feet. The Front Range peaks rise to an elevation of 14,000 feet just to the west of Longmont. In general, the area experiences low relative humidity, light precipitation and abundant sunshine.

The station began operations in 1985 with the installation of PM<sub>10</sub> followed by PM<sub>2.5</sub> monitors in 1999. The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 36 µg/m<sup>3</sup>, while the maximum PM<sub>2.5</sub> concentration recorded was 27.2 µg/m<sup>3</sup>. Both values are below their respective standards of 150 µg/m<sup>3</sup>, and 35 µg/m<sup>3</sup> (over 24 hours).

Longmont's predominant wind direction is from the north through the west due to winds draining from the St. Vrain Creek Canyon. The PM<sub>10</sub> site is near the center of the city near both commercial and residential areas. This location provides the best available monitoring for population exposure to particulate matter. The distance and traffic estimate for the controlling street easily falls into the neighborhood scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 6 day sample schedule.

**Longmont, 440 Main Street (08 013 0009):**

The town of Longmont is a growing, medium sized, Front Range community located between the Denver/Boulder Metro-area and Fort Collins. Longmont is both suburban and rural in nature. There are no major CO sources within 12 miles of the monitor.

In January and February of 1988 and again in the winter of 1988/89 the APCD conducted a study at a site near 11<sup>th</sup> Avenue and Main Street, a few blocks north of the downtown area. Because two exceedances of the standard were recorded during the study, the Division felt that a permanent CO site should be established closer to the downtown area. These exceedances resulted in Longmont being designated as a CO nonattainment area and required a SIP for CO be developed showing attainment by December 31, 1995. The Air Quality Control Commission accepted the Longmont SIP on June 16, 1995. In 1999, Longmont was redesignated as an attainment area.

Longmont has contended that its CO problems are generally the result of transport from the Denver metropolitan area north to the Longmont area. The review of the time series plots for Longmont, Denver CAMP, Greeley and Boulder show that the CO maximum at all four locations generally coincide. In addition, these peaks are bimodal at 7 to 9 A.M. and 4 to 6 P.M. at all four locations. This pattern is associated with locally generated emissions from traffic, not transport from another area. The CO emissions inventories developed for the SIP show that 78% of the CO comes from on-road mobile sources. These findings are consistent with the observed distribution of the data.

CO monitoring is expected to continue for the next several years at the current location since the monitoring is a part of the maintenance plan for Longmont. The monitor is in the SLAMS network, and is population oriented for a neighborhood scale. The eight hour maximum CO concentration recorded at this site in 2010 was 2.6 ppm, while the maximum one hour concentration was 4.5 ppm. Both values are well below the NAAQS.

**South Boulder Creek, 1405½ S. Foothills Parkway (08 013 0011):**

The city of Boulder is located about 30 miles to the northwest of Denver. The Boulder Foothills, South Boulder Creek site was established as a special-purpose O<sub>3</sub> monitor as a part of the “summer 1993 Denver O<sub>3</sub> Study.” During that summer a one hour level of 0.128 ppm was recorded on July 2, 1993. In 1994, the monitor was converted from an SPM to a seasonal SLAMS monitor. In 1995 it was converted to a year-round O<sub>3</sub> monitoring site when the instruments were moved into a new shelter.

Although the Foothills monitor had not exceeded the previous standard of 0.085 ppm as an eight hour average, it does exceed the current standard of 0.075 ppm as an eight hour average five of the past six years, and will exceed the new standard (0.060 to 0.070 ppm) due to be released in August 2011. The first maximum eight hour value recorded at this site in 2010 was 0.082 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration is 0.073 ppm for the 2008 through 2010 time period. This is a highest concentration oriented urban scale SLAMS monitor.

**Boulder Chamber of Commerce, 2440 Pearl Street (08 013 0012):**

The city of Boulder is located on the eastern edge of the Rocky Mountain foothills. Most of the city sits on rolling plains. The Boulder PM<sub>2.5</sub> site is approximately 7,000 feet east of the base of the Front Range foothills and about 50 feet south of a small branch of Boulder Creek, the major creek that runs through Boulder.

PM<sub>10</sub> monitoring began at this site in December of 1994, while the PM<sub>2.5</sub> monitoring did not begin until January of 1999. The maximum PM<sub>10</sub> concentration recorded here in 2010 was 50 µg/m<sup>3</sup>, while the maximum PM<sub>2.5</sub> concentration was 44.7 µg/m<sup>3</sup>. The PM<sub>10</sub> values were all well below the standard of 150 µg/m<sup>3</sup>. The PM<sub>2.5</sub> concentration was an exceedance of the standard. The exceedance was due to a wildfire that was burning in the area. Since wildfires are natural, uncontrollable events, which may be excluded under EPA's Exceptional Event Rule, the Division may document this as an exceptional event.

The predominant wind direction at the Division's closest meteorological site (Rocky Flats – North) is from the west with secondary maximum frequencies from the west-northwest and west-southwest. The distance and traffic estimate for Pearl Street and Folsom Street falls into the middle scale, but the site has been justified to represent a neighborhood scale site in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D. This is a population oriented neighborhood scale SLAMS monitoring site on a 1 in 6 day sample schedule.

**Boulder – CU - Athens, 2102 Athens Street (08 013 1001):**

The Boulder - CU site is located at the edge of a low usage parking lot to the immediate north of the site and south of the University of Colorado football practice fields.. This location provides a good neighborhood representation for particulates. The site began operation in November 2004, and may be removed in 2011 or 2012 due to construction of a new covered air-filled dome covering the practice fields that obstructs air flow. The dome is erected each Fall, and remains

inflated until early Spring. It is removed during the Summer months. The maximum PM<sub>2.5</sub> value recorded by the continuous monitor at this site in 2010 was 57.7 µg/m<sup>3</sup>, which was recorded during the Fourmile Canyon Wildfire that mainly burned from Sept. 6 - Sept. 10, 2010. There were two exceedances recorded due to the Fourmile Canyon wildfire that was burning just west of Boulder. Wildfires are natural uncontrollable events, which may be excluded under the exceptional event rule. However, the Division will not document this as an exceptional event since the site uses a TEOM monitor that is not used for regulatory purposes. This is a population oriented neighborhood scale special project monitor.

**Delta, 560 Dodge Street (08 029 0004):**

Delta is a small agricultural community midway between Grand Junction and Montrose. The topography in and around Delta is relatively flat as it sits in the broad flat Uncompaghre River Valley. There are high mesas and mountains surrounding this high valley. Delta sits in a large bowl shaped basin that can effectively trap air pollution, especially during persistent temperature inversions.

The Delta County Health Department site was chosen because it is a one story building near the downtown area. The site began operation in August 1993, and is representative of the large basin with the potential for high PM<sub>10</sub> due to agricultural burning, automobile traffic and the former Louisiana Pacific wafer board plant. The maximum PM<sub>10</sub> value recorded at this site in 2010 was 125 µg/m<sup>3</sup>. There were no exceedances of the standard at this location in 2010. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

**Denver CAMP, 2105 Broadway (08 031 0002):**

The City and County of Denver is located approximately 30 miles east of the foothills of the Rocky Mountains. Denver sits in a basin, and the terrain of the city is characterized as gently rolling hills, with the Platte River running from southwest to northeast, just west of the downtown area. The CAMP site is located in downtown Denver.

CO monitoring began in February 1965 as a part of the Federal Continuous Air Monitoring Program. It was established as a maximum concentration (micro-scale), population-oriented monitor. The CAMP site measures the exposure of the people who work or reside in the central business district (CBD). Its location in a high traffic street canyon causes this site to record most of the high pollution episodes in the metro area. The street canyon effect at CAMP results in variable wind directions for high CO levels and as a result wind direction is less relevant to high concentrations than wind speed. Wind speeds less than 1 mph, especially up-valley, combined with temperature inversions trap the pollution in the area. The eight hour maximum CO value recorded in 2010 at this site was 3.1 ppm, while the one hour maximum was 4.3 ppm. Both values are well below the NAAQS.

The NO<sub>2</sub> monitor began operation in January 1973 at this location. The one-hour design value cannot be calculated due to data validity issues in previous years. The annual average at this site was 28 ppb, which is well below the standard.

The SO<sub>2</sub> monitor began operation in January 1967. The 3-hour maximum value recorded in 2010 was 20 ppb, while the 24-hour maximum was 10 ppb. The annual average was 20 ppb. The one hour design value cannot be calculated due to data validity issues in previous years. All values are well below the NAAQS.

The PM<sub>10</sub> monitoring began in 1986 with the installation of collocated monitors, and was furthered by the addition of a continuous monitor in 1988. The maximum concentration recorded in 2010 by the monitor was 58 µg/m<sup>3</sup>. The maximum recorded by the continuous monitor was 63 µg/m<sup>3</sup>. The values are well below the NAAQS.

The PM<sub>2.5</sub> monitoring began in 1999 with a continuous and an FEM monitor, and was furthered by the addition of a collocated FEM monitor in 2001. The maximum concentration recorded in 2010 by the monitor was 26.0 µg/m<sup>3</sup>. The value is well below the NAAQS.

Meteorological monitoring began at this site in January of 1965.

**Denver NJH-E, 14<sup>th</sup> Avenue & Albion Street (08 031 0013):**

This site is located three miles east of the Denver CBD, close to one of the busiest intersections in Denver (Colorado Boulevard and Colfax Avenue). The current site began operations in 1982. Two previous sites were located just west of the current location. The first operated for only a few months before it was moved to a new and “temporary” site in the corner of the laboratory building at the corner of Colorado Boulevard and Colfax Avenue. The maximum PM<sub>2.5</sub> concentration recorded by the continuous monitor at this site in 2010 was 49.4 µg/m<sup>3</sup>, which is an exceedance of the 24-hour NAAQS. However, data from this continuous TEOM monitor is not compared with the NAAQS. It is used for short term forecasting and public notifications. The monitor here is a population oriented middle scale special project monitor.

**Denver - Carriage, 2325 W. Irving Street (08 031 0014):**

Carriage is located 2.5 miles west of the CBD. It began operations in January of 1982. The site represents an ideal neighborhood exposure setting due to its unique location in an old carriage lot in the center of the block surrounded by houses. It represents a good neighborhood site for O<sub>3</sub> exposure since it is isolated enough to be unaffected by local traffic. O<sub>3</sub> levels at this site have not exceeded the old one hour NAAQS since 1987. The first maximum eight hour O<sub>3</sub> concentration recorded at this site in 2010 was 0.073 ppm. The 3-year average of the 4<sup>th</sup> highest O<sub>3</sub> concentration from 2008 through 2010 is 0.068 ppm, which is less than the current standard of 0.075 ppm. However, when the standard is changed in August 2011, the value will either be equal to the standard or above it, as the new standard will be in the range of 0.060 to 0.070 ppm. This is a population oriented neighborhood scale SLAMS monitor.

**Denver Visitor Center, 225 W. Colfax Avenue (08 031 0017):**

The Denver Visitor Center site is located near the corner of Colfax Avenue and Tremont Street. It began operation on December 28, 1992. In 1993, this site along with the Denver CAMP and Gates monitors recorded the first exceedances of the 24-hour PM<sub>10</sub> standard in the Denver metropolitan area since 1987. The Visitor Center recorded a PM<sub>10</sub> level of 161 µg/m<sup>3</sup> on January 14, 1993. Since then, the maximum value recorded at the site has been 119 µg/m<sup>3</sup> in 2001. In 2010 the maximum value recorded was 62 µg/m<sup>3</sup>, which is well below the NAAQS of 150 µg/m<sup>3</sup>. In the past ten years, the 24-hour maximum levels have trended downward. This is a population oriented middle scale SLAMS monitor operating on a daily sample schedule.

**Denver Firehouse #6, 1300 Blake Street (08 031 0019):**

The Denver Firehouse #6 is located on the block between Auraria Parkway and Blake Street where they intersect with Speer Boulevard. This is one of the busiest intersections in downtown Denver, and computer modeling indicated that it would have high levels of CO. The monitor is



in the SLAMS network and is population oriented for a micro-scale.

In the winter of 1995, the monitor was converted from a special purpose monitor to a SLAMS monitor. In 1999, the Firehouse monitor recorded the last exceedance of the eight hour CO standard in the Denver Metro area. The levels have continued their decline and in 2010 the maximum eight hour concentration was 2.7 ppm, and the maximum one-hour concentration was 3.4 ppm, which are both well below the NAAQS.

**Denver – Swansea Elementary, 4650 Columbine Street (08 031 0023):**

The Denver - Swansea Elementary school site was first established as a part of the toxicological study associated with the ASARCO Study conducted by the Colorado Department of Public Health and Environment. The site was later established in December of 2004 as a special purpose monitor to gather pre-construction background concentrations for the potential I-70 corridor planned move to the north. Since, high PM<sub>2.5</sub> concentrations have been recorded at the PSM site, so the Division decided to keep the site and made it a permanent SLAMS site. The highest concentration recorded at this site in 2010 was 23.2 µg/m<sup>3</sup>, which is below the NAAQS. This population oriented neighborhood scale SLAMS monitor is operating on a daily sampling schedule.

**Denver Municipal Animal Shelter, 678 S. Jason Street (08 031 0025):**

The Denver Municipal Animal Shelter (DMAS) site was established as a replacement for the Denver Gates particulate monitoring site when the building was demolished and other constructed nearby. The Gates site was located at 1050 S. Broadway, about one half mile south-southeast and on the east side of the South Platte River. The DMAS location represents the core area of the South Platte drainage in Denver. It has a good mixture of light industrial and residential areas, and is strongly affected by the mobile sources along I-25 as well as South Santa Fe Drive. The openness of the area also permits the meteorological data to be representative of the larger core Denver area. Finally, the site is on city owned property and will presumably be available for long-term trend analysis. The site has been established as the NCore site for the Denver Metropolitan area and includes a trace gas/precursor-level CO analyzer and a NO<sub>y</sub> analyzer, in addition to the trace level SO<sub>2</sub>, O<sub>3</sub>, meteorology and particulate monitors. The site is represents a population oriented neighborhood scale monitoring area.

The trace level SO<sub>2</sub>, CO and NO<sub>y</sub> analyzers began operation in January 2011 at this location.

The first maximum eight hour O<sub>3</sub> concentration recorded at this site in 2010 was 0.068 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for this site from 2008 through 2010 is 0.065 ppm.

The meteorological monitoring began in July of 2008. During the course of 2011 additional sensors will be added to the met monitoring network. These sensors will include barometric pressure, solar radiation, and precipitation.

PM<sub>10</sub> monitoring began in July 2005. Currently, there is a pair of collocated high volume samplers on the roof of the municipal shelter building and a Lo-Vol PM<sub>10</sub> on the trailer roof. These concurrent PM<sub>10</sub> measurements will be compared prior to removing the Hi-Vol PM<sub>10</sub> monitors. The Lo-vol PM<sub>10</sub> concentrations are more useful as they can be used with the PM<sub>2.5</sub> measurements to calculate PM<sub>10-2.5</sub> or coarse PM. The maximum PM<sub>10</sub> value recorded by the monitor was 56 µg/m<sup>3</sup>, and that recorded by the continuous monitor was 60 µg/m<sup>3</sup>. Both values

are well below the NAAQS.

PM<sub>2.5</sub> monitoring began in April 2007 with the installation of a FRM monitor. A continuous TEOM/FDMS FEM instrument was added in September, 2007 and a supplemental PM<sub>2.5</sub> speciation monitor was added in January 2010, A carbon speciation monitor was added in 2010. The maximum PM<sub>2.5</sub> value recorded by the monitor in 2010 was 24.8 µg/m<sup>3</sup>, which is below the NAAQS.

TSP/lead (Pb-TSP) monitoring began in July of 2005. The largest value recorded by the lead monitor was 0.02 µg/m<sup>3</sup>, which is well below the level of the standard at 0.15 µg/m<sup>3</sup>. The largest TSP concentration recorded was 107 µg/m<sup>3</sup>.

#### **Chatfield State Park, 11500 N. Roxborough Park Road (08 035 0004):**

The Chatfield State Park location was established as the result of the 1993 Summer O<sub>3</sub> Study. The site is located on the south side of Chatfield State Park at the park offices. This location was selected over the Corps of Engineers Visitor Center across the reservoir because it was more removed from the influence of traffic along C-470. Located in the South Platte River drainage, this location is well suited for monitoring southwesterly O<sub>3</sub> formation in the Denver metro area.

The Chatfield monitor has exceeded the O<sub>3</sub> standard each of the past five years and the trend of the 3-year averages is increasing. The eight hour maximum concentration recorded at this site in 2010 was 0.081 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 is 0.076 ppm, which exceeds the current standard, and will exceed the new lowered standard to be announced in August 2011. The new standard is expected to be in the 0.060 to 0.070 ppm range. This is a highest concentration oriented urban scale SLAMS monitor.

PM<sub>2.5</sub> monitoring began at this site in 2004 with the installation of a continuous monitor, and was furthered by the addition of an FEM monitor in 2005. The maximum concentration recorded at this site in 2010 was 19.4 µg/m<sup>3</sup>, which is below the NAAQS.

Meteorological monitoring began in April of 2004.

#### **Colorado Springs, USAFA Road 640 (08 041 0013):**

The United States Air Force Academy site was installed as a replacement maximum concentration O<sub>3</sub> monitor for the Chestnut Street (08 041 0012) site. Modeling in the Colorado Springs area indicates that high O<sub>3</sub> concentrations should generally be found along either the Monument Creek drainage to the north of the Colorado Springs central business district (CBD), or to a lesser extent along the Fountain Creek drainage to the west of the CBD. The decision was made to locate this site near the Monument Creek drainage, approximately 9 miles north of the CBD. This location is near the south entrance of the Academy but away from any roads. This is a population oriented urban scale SLAMS monitor.

The Academy monitor did record an exceedance of the old one hour standard in 2003 but it would not have recorded any exceedances of the current eight hour standard. However the trend in values over the past ten years is increasing. The first maximum eight hour O<sub>3</sub> concentration recorded at this site in 2010 was 0.080 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 is 0.066 ppm, which is below the current NAAQS, but will likely be above the new O<sub>3</sub> standard set to be released in August 2011. The new standard value is expected to lie between 0.060 and 0.070 ppm.

**Colorado Springs Hwy-24, 690 W. Highway 24 (08 041 0015):**

The 690 W. Highway 24 site is located just to the west of I-25 and just to the east of the intersection of U.S. Highway 24 and 8<sup>th</sup> Street, approximately 0.8 miles to the west of the Colorado Springs CBD. Commencing operation in November 1998, this site is a replacement for the Tejon Street (08 041 0004) CO monitor. The site is located in the Fountain Creek drainage and is in one of the busiest traffic areas of Colorado Springs. Additionally, traffic is prone to back-up along Highway 24 due to a traffic light at 8<sup>th</sup> Street. Thus, this site is well suited for the SLAMS network to monitor maximum concentrations of CO in the area both from automotive sources and also from nearby industry, which includes a power plant. It also provides a micro-scale setting for the Colorado Springs area, which has not been possible in the past.

The eight hour maximum CO value recorded at this site in 2010 was 2.3 ppm, and the one hour max was 4.6 ppm, which are both well below their respective NAAQS.

**Manitou Springs, 101 Banks Place (08 041 0016):**

Manitou Springs is located 4 miles west of Colorado Springs. It was established because of concern that the "O<sub>3</sub> cloud" was traveling farther up the canyon and the current monitoring network was not adequate. The Manitou Springs monitor began operations in April 2004. It is located in the foothills above Colorado Springs in the back of the maintenance area at the site. In its six seasons of operation it has not recorded any levels greater than the current standard. The trend in eight hour concentrations is increasing, however.

The eight hour maximum O<sub>3</sub> value recorded at this site in 2010 was 0.086 ppm, which is above the current NAAQS. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> value for 2008 through 2010 is 0.069. This value will likely exceed the new standard (0.060 to 0.070 ppm) due to be released in August 2011. This is a population oriented neighborhood scale SLAMS monitor.

**Colorado Springs - Colorado College, 130 W. Cache la Poudre Street (08 041 0017):**

The Colorado Springs - Colorado College monitoring site was established in January, 2007 after the revised particulate regulations required that Colorado Springs needed a continuous PM<sub>2.5</sub> monitor. The Division elected to collocate the new PM<sub>2.5</sub> monitor with the corresponding filter based monitors from the RBD site at the Colorado College location, which included a FRM PM<sub>2.5</sub> monitor and added a low volume FEM PM<sub>10</sub> monitor in November, 2007. The continuous monitor began operation in April of 2008.

The nearest representative meteorological site is located at the Colorado Springs Airport. Wind flows at the Colorado College site are affected by its proximity to Fountain Creek, so light drainage winds will follow the creek in a north/south direction. The three monitoring sites here are population oriented neighborhood scale monitors, two on the SLAMS network (PM<sub>10</sub> and PM<sub>2.5</sub>) and one that is a special projects monitor (PM<sub>2.5</sub> continuous).

The maximum value recorded by the PM<sub>10</sub> monitor at this site in 2010 was 41 µg/m<sup>3</sup>, which is well under the NAAQS. The maximum value recorded by the PM<sub>2.5</sub> monitor at this site in 2010 was 14.9 µg/m<sup>3</sup>; again this value is well under the NAAQS.

**Cañon City - City Hall, 128 Main Street (08 043 0003):**

Cañon City is located 39 miles west of Pueblo. Particulate monitoring began on January 2, 1969 with the operation of a TSP monitor located on the roof of the courthouse building at 7<sup>th</sup> Avenue and Macon Street. The Macon Street site was relocated to the City Hall in October of 2004.

The Cañon City PM<sub>10</sub> site began operation in December 1987. On May 6, 1988, the Macon Street monitor recorded a PM<sub>10</sub> concentration of 172 µg/m<sup>3</sup>. This is the only exceedance of either the 24-hour or annual NAAQS since PM<sub>10</sub> monitoring was established at Cañon City. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 6 day sample schedule.

The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 31 µg/m<sup>3</sup>, which is well below the NAAQS.

**Parachute – High School, 100 E. 2<sup>nd</sup> Street (08 045 0005):**

The parachute site began operation in May 2000 with the installation of a PM<sub>10</sub> monitor at the high school. The annual average has been trending upward, but is still just over one half of the former annual standard for PM<sub>10</sub> which was 50µg/m<sup>3</sup>. The maximum value recorded at this site in 2010 was 125 µg/m<sup>3</sup>, which is below the NAAQS. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

**Rifle - Henry Building, 144 3<sup>rd</sup> Street (08 045 0007):**

The first Rifle site began operation in June 1985 and ended operation in May 1986. The next site began operation in December 1987 and continued until 2001. The levels at that site, with the exception of the March 31, 1999 high wind event, were always less than one half of both the annual and the 24-hour standards. The current location on the Henry Building began operation in May of 2005 with the installation of a PM<sub>10</sub> monitor as a part of the Garfield County study. There are now two population oriented neighborhood scale special project PM<sub>10</sub> monitoring sites: one on a 1 in 3 day sample schedule, and one that is continuous. There is also a continuous PM<sub>2.5</sub> monitor, a continuous PM Course monitor, and meteorological monitors. The maximum PM<sub>10</sub> value recorded at this site in 2010 was 59 µg/m<sup>3</sup>, which is well below the NAAQS.

**Rifle – Health Dept., 195 14<sup>th</sup> Ave (08 045 0012):**

The Rifle Health site is located at the Garfield County Health Department building. The site is 1 km to the north of the downtown area and next to the Garfield County fairgrounds. The site is uphill from the downtown area. A small residential area is to the north and a commercial area to the east. This site was established to measure O<sub>3</sub> in Rifle, which is the largest population center in the oil and gas impacted area of the Grand Valley. Monitoring commenced in June 2008. This is a special projects monitor with a neighborhood scale. The eight hour maximum O<sub>3</sub> concentration recorded at this site in 2010 was 0.069 ppm, which is below the current standard. This may change, however, when the new standard is introduced in August 2011. It is expected to be in the range of 0.060 to 0.070 ppm. The 3-year 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 is 0.064 ppm.

**Crested Butte, 603 6<sup>th</sup> Street (08 051 0004):**

The Crested Butte PM<sub>10</sub> site began operation in June 1985. Crested Butte is a high mountain ski town. The monitor is at the east end of town near the highway and in the central business district. Any wood burning from the residential area to the west directly affects this location. The physical setting of the town, near the end of a steep mountain valley, makes wood burning, street sanding and wintertime inversions a major concern. The town is attempting to regulate the number of wood burning appliances, since this is a major source of wintertime PM<sub>10</sub>.

There are two population oriented neighborhood scale monitors here, one in the SLAMS network (1 in 3 day sample schedule) and one that is a continuous monitor . Crested Butte has recorded

one exceedance of the NAAQS since it began monitoring, and that was in 2010. The maximum PM<sub>10</sub> value recorded at this site by the monitor in 2010 was 174 µg/m<sup>3</sup>, while the value recorded by the continuous monitor was 61 µg/m<sup>3</sup>.

**Mt. Crested Butte Realty, 19 Emmons Road (08 051 0007):**

Mount Crested Butte is located at an elevation of 8,940 feet (2,725 m) at the base of the Crested Butte Mountain Resort ski area. Mount Crested Butte is a unique location for high particulate matter concentrations because it is located on the side of a mountain (Crested Butte 12,162 ft. or 3,707 m), not in a bowl, valley, or other topographic feature that would normally trap air pollutants. There is not a representative meteorological station in or near Mt. Crested Butte.

The location for the Mt. Crested Butte site was selected because it had an existing PM<sub>10</sub> site that had several high PM<sub>10</sub> concentrations including five exceedances of the 24-hour standard in 1997 and one in 1998. Mt. Crested Butte also exceeded the PM<sub>10</sub> annual average standard in 2010. A CMB source apportionment from 10 PM<sub>10</sub> filters identified crustal material as the mostly likely source (91%) of PM<sub>10</sub>. Carbon, which is most likely from residential wood smoke, made up 8% of the statistically composite sample and secondary species made up the remaining one percent. The Mt. Crested Butte site was also selected because it is an area representative of the residential impact of PM<sub>2.5</sub>. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The maximum PM<sub>10</sub> value recorded at this site in 2010 was 168 µg/m<sup>3</sup>.

**Arvada, 9101 57<sup>th</sup> Avenue (08 059 0002):**

The city of Arvada is located 15 miles west-northwest of the Denver central business district (CBD). The Arvada site began operation before 1973. It is located to the northwest of the Denver CBD near the western end of the diurnal midday wind flow of the O<sub>3</sub> “cloud.” As a result, when conditions are proper for daylong O<sub>3</sub> production, this site has received some of the highest levels in the city. In the early and mid 1990s, these wind patterns caused Arvada to have the most exceedances in the metro area.

The Arvada monitor has exceeded the O<sub>3</sub> standard seven of the past eleven years, and the years that it would not have exceeded the standard it was just below the level of the standard. The eight hour maximum O<sub>3</sub> value recorded at this site in 2010 was 0.077 ppm. The 3 year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 is 0.073 ppm, which is just below the level of the current standard (0.075 ppm). When the new standard comes out in August 2011, this site will not be in compliance with it, as it is expected to be in the 0.060 to 0.070 ppm range. This is a population oriented neighborhood scale SLAMS monitor.

Meteorological monitoring began in 1975.

**Welch, 12400 W. Highway 285 (08 059 0005):**

The Division conducted a short-term O<sub>3</sub> study on the grounds of Chatfield High School from June 14, 1989 until September 28, 1989. The Chatfield High School location was chosen because it sits on a ridge southwest of the Denver CBD. Wind pattern studies showed a potential for elevated O<sub>3</sub> levels in the area on mid to late afternoon summer days. There were no exceedances of the NAAQS recorded at the Chatfield High School site, but the levels were frequently higher than those recorded at the other monitoring sites south of the metro area.

One finding of the study was the need for a new, permanent site further north of the Chatfield High School location. As with most Denver locations, the predominant wind pattern is north/south. The southern flow occurs during the upslope, daytime warming period. The northern flow occurs during late afternoon and nighttime when drainage is caused by cooling and settling. The major drainages of Bear Creek and Turkey Creek were selected as target downwind transport corridors. These are the first major topographical features north of the Chatfield High School site. A point midway between the valley floor (Englewood site) and the foothill's hogback ridge was modeled to be the best estimate of the maximum downwind daytime transport area. These criteria were used to evaluate available locations. The Welch site best met these conditions. This site is located off State Highway 285 between Kipling Street and C-470.

The Welch monitor has not exceeded the new standard in the past eleven years. However, since 2002 the trend in values is increasing, and in 2008 the 3-year average was above the level of the standard. In 2010 the first maximum eight hour O<sub>3</sub> value recorded at this site was 0.076 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration is 0.071 ppm for 2008 through 2010, which is just below the level of the current standard of 0.075 ppm. Once the standard is revised in August 2011, this site will be in exceedance of the new standard, which is expected to be in the range of 0.060 and 0.070 ppm. This is a population oriented urban scale SLAMS monitor.

**Rocky Flats - N, 16600 W. Highway 128 (08 059 0006):**

The Rocky Flats - N site is located north-north east of the plant on the south side of Colorado Highway 128, approximately 1¼ miles to the west of Indiana Street. The site began operation in June 1992 with the installation of an O<sub>3</sub> monitor and meteorological monitors as a part of the first phase of the APCD's monitoring effort around the Rocky Flats Environmental Technology Site.

O<sub>3</sub> monitoring began as a part of the "Summer 1993 Ozone Study." The monitor recorded some of the highest O<sub>3</sub> levels of any of the sites during that study. Therefore, it was included as a regular part of the APCD O<sub>3</sub> monitoring network. The Rocky Flats – N monitor has exceeded the current standard each of the last eleven years and fourteen out of the last sixteen years. The eight hour maximum O<sub>3</sub> concentration recorded at this site in 2010 was 0.083 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 is 0.078 ppm, which exceeds the level of the current standard, and will exceed the level of the proposed new standard (0.060 to 0.070 ppm). This is a highest concentration oriented urban scale SLAMS monitor.

**Rocky Flats - SE, 9901 Indiana Street (08 059 0008):**

This site is located along Indiana Street southeast of Rocky Flats. The winds at this location are appreciably different from either the Rocky Flats North site or the Arvada site. The site began operation in August of 1991. The site is scheduled for shut-down and removal in 2011.

**NREL Solar Radiation Research Laboratory, 2054 Quaker Street (08 059 0011):**

The National Renewable Energy Laboratory (NREL) site is located on the south rim of South Table Mountain, near Golden, and was part of the "1993 Summer Ozone Study." Based on the elevated concentrations found at this location, it was made a permanent monitoring site in 1994. This site typically records some of the higher eight hour O<sub>3</sub> concentrations in the Denver area. It has exceeded the current standard each of the past 15 years it has been in operation. The eight hour maximum concentration recorded at this site in 2010 was 0.079 ppm. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 is 0.072 ppm, which is below the

level of the current standard, and will be above the level of the proposed new standard (0.060 to 0.070 ppm). This is a highest concentration oriented urban scale SLAMS monitor.

**Aspen Park, 26137 Conifer Road (08 059 0013):**

The Aspen Park site began operation in May 2009. It is intended to verify/refute model predictions of above normal O<sub>3</sub> levels. In addition, passive O<sub>3</sub> monitors used in the area in a 2007 study indicated the possibility of higher O<sub>3</sub> levels. The monitor is located in an urban setting at a Park N Ride facility off of Highway 285, at an elevation of just over 8,100 feet. Because the site is nearly 3,000 feet higher than the average metro area elevation, it should see O<sub>3</sub> levels that are larger than those seen in the metro area, as O<sub>3</sub> concentrations increase with increasing elevation. Whether or not the increased concentrations will be a health concern will be determined with the data gathered from this monitor. This is a special purpose neighborhood scale monitor.

The eight hour maximum O<sub>3</sub> concentration recorded at this site in 2010 was 0.080 ppm. A 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration cannot be calculated for this site from 2008 through 2010 as it began operation in 2009.

**Durango - River City Hall, 1235 Camino del Rio (08 067 0004):**

Durango is the second largest city on the western slope. The town is situated in the Animas River Valley in southwestern Colorado. Its elevation is approximately 6,500 feet (1981 meters) above mean sea level. The Animas valley through Durango is steep and narrow. Even though little meteorological information is available for the area, the microclimate of Colorado mountain communities is characterized by cold air subsidence, or drainage flows during the evening and early morning hours and up valley flows during afternoon and early evening hours when solar heating is highest. Temperature inversions that trap air pollutants near the surface are common during night and early morning hours. This is a population oriented neighborhood scale SLAMS monitor that samples continuously.

The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 320 µg/m<sup>3</sup>, which is an exceedance of the NAAQS. This site also exceeded the NAAQS one other time with a value of 226 µg/m<sup>3</sup>.

**Fort Collins – CSU – Edison, 251 Edison Street (08 069 0009):**

Fort Collins does not have the population to require a particulate monitor under Federal regulations. However, it is one of the largest cities along the Front Range. There are two population oriented neighborhood scale SLAMS monitors, a PM<sub>10</sub> and a PM<sub>2.5</sub>, that sample on a 1 in 3 day sample schedule. There are also two continuous monitors, one PM<sub>10</sub> and one PM<sub>2.5</sub>.

The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 56 µg/m<sup>3</sup>, while that recorded by the continuous monitor was 44 µg/m<sup>3</sup>. The maximum PM<sub>2.5</sub> concentration recorded was 27.7 µg/m<sup>3</sup>. All values are below their respective NAAQS.

**Fort Collins - West, 3416 W. La Porte Avenue (08 069 0011):**

The Fort Collins-West monitor began operation in May of 2006. The location was established based on modeling and to satisfy permit conditions for a major source in Fort Collins area. The levels recorded for the first season of operation showed consistently higher concentrations than the 708 S. Mason Street monitor. For 2010 the 3-year average of the 4<sup>th</sup> maximum eight hour

average value was 0.074 ppm. This site does not exceed the current standard of 0.075 ppm, but will exceed the proposed new standard of 0.060 to 0.070 ppm when it is introduced in August 2011. The highest eight hour average recorded here in 2010 was 0.077 ppm. This is a highest concentration oriented urban scale SLAMS monitor.

**Rist Canyon, 11838 Rist Canyon Road, (08 069 0012):**

The Rist Canyon site began operation in May 2009. The monitor is located within the Rist Canyon Volunteer Fire Department Station Number 1, in the foothills west of Fort Collins. The monitor is at an elevation of 6,750 feet, which is roughly 1,600 feet above the Fort Collins – West monitor. Model predictions have indicated possible elevated O<sub>3</sub> levels in this area. The site is intended to verify/refute the model prediction. This is an urban scale special purpose monitor.

In 2010 the largest eight hour average O<sub>3</sub> concentration recorded at this site was 0.074 ppm. A 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentration for 2008 through 2010 cannot yet be calculated for this site as it just began operation in 2009.

**Fort Collins- Mason, 708 S. Mason Street (08 069 1004):**

The 708 S. Mason Street site began operation in December 1980 and is located one block west of College Avenue in the Central Business District. The one hour CO standard of 35 ppm as a one hour average has only been exceeded on December 1, 1983, at 4:00 P.M. and again at 5:00 P.M. The values reported were 43.9 ppm and 43.2 ppm respectively. The eight hour standard of 9 ppm was exceeded one or more times a year from 1980 through 1989. The last exceedances were in 1991 on January 31 and December 6 when values of 9.8 ppm and 10.0 ppm respectively were recorded.

Fort Collins does not have the population to require a CO monitor under Federal regulation. However, it is one of the largest cities along the Front Range and was declared in nonattainment for CO in the mid-1970s after exceeding the eight hour standard in both 1974 and 1975. The current level of monitoring is in part a function of the resulting CO SMP for the area. It is a population oriented neighborhood scale SLAMS monitor. The eight hour maximum concentration recorded at this site in 2010 was 2.0 ppm. The one hour max recorded was 2.9 ppm. Both values are well below the NAAQS for CO.

O<sub>3</sub> monitoring began in 1980, and continues today. The eight hour average O<sub>3</sub> maximum value recorded here in 2010 was 0.068 ppm, which is just below the level of the current standard. The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentrations for 2008 through 2010 is 0.065 ppm, which is below the level of the current standard, but could be above the level of the proposed new standard depending on where it is set (0.060 to 0.070 ppm).

**Grand Junction - Powell, 650 South Avenue (08 077 0017):**

Grand Junction is the largest city on the western slope in the broad valley of the Colorado River. The monitors are on county owned buildings in the south side of the city. The site is on the southern end of the central business district and close to the industrial area along the train tracks. It is about a half a mile north of the river and about a quarter mile east of the railroad yard. This site monitors for 24-hour and hourly PM<sub>10</sub> as well as for 24-hour and hourly PM<sub>2.5</sub>.

The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 155 µg/m<sup>3</sup>, which is above the level of the standard. The maximum PM<sub>2.5</sub> concentration recorded here in 2010 was 43.3



$\mu\text{g}/\text{m}^3$ . This is an exceedance of the standard.

**Grand Junction - Pitkin, 645¼ Pitkin Avenue (08 077 0018):**

The Grand Junction-Pitkin CO monitor began operation in January 2004. This monitor replaced the site at the Stocker Stadium. The Stocker Stadium location had become less than ideal with the growth of the trees surrounding the park and the Division felt that a location nearer to the central business district (CBD) would provide a better representation of CO concentration values for the city. The CO concentrations at the Stocker Stadium site had been declining from an eight hour maximum in 1991 of 7.8 ppm to a 3.3 ppm in 2003. The Pitkin monitor has shown a continuing decline in the maximum eight hour average values to 1.2 ppm in 2010, which is well below the standard. The maximum one hour average was 1.7 ppm, also well below the NAAQS. It is a population oriented, micro-scale SLAMS monitor.

Meteorological monitors were installed in 2004, and include wind speed, wind direction, temperature and relative humidity sensors.

**Clifton, Hwy 141 & D Road (08 077 0019):**

The Clifton PM<sub>10</sub> monitor is located in the town of Clifton which is a southeastern suburb of Grand Junction, Colorado. The monitor is in a low usage parking lot operated by the sanitation district. It is one half mile north of the Colorado River. The site was established at the request of the Mesa County Health Department to address concerns of oil and gas related industries in the area.

The population oriented neighborhood scale SLAMS monitor began operations in October 2007, and operates on an every third day schedule. The maximum PM<sub>10</sub> concentration recorded at this site in 2010 was 189  $\mu\text{g}/\text{m}^3$ , which exceeds the level of the standard.

**Palisade Water Treatment, Rapid Creek Rd (08 077 0020):**

The Palisade site is located at the Palisade Water Treatment Plant. The site is 4 km to the east-northeast of downtown Palisade, just into the De Beque Canyon area. The site is remote from any significant population and was established to measure maximum concentrations of O<sub>3</sub> that may result from summertime up-flow conditions into a topographical trap. Monitoring commenced in May 2008. This is an urban scale special purpose monitor. The first maximum eight hour average O<sub>3</sub> concentration recorded at this site in 2010 was 0.070 ppm, which is below the level of the current standard. This could change, however, when the proposed new O<sub>3</sub> standard is announced in August 2010. It is expected to be in the range of 0.060 to 0.070 ppm. The 3-year average of the 4<sup>th</sup> maximum eight hour O<sub>3</sub> values for this site for 2008 through 2010 is 0.067 ppm.

**Cortez, 106 W. North St (08 083 0006):**

The Cortez site is located in downtown Cortez at the Montezuma County Health Department building. Cortez is the largest population center in Montezuma County in the southwest corner of Colorado. Currently, there are O<sub>3</sub> and PM<sub>2.5</sub> monitors in operation at this site.

The O<sub>3</sub> site was established to address community concerns of possible high O<sub>3</sub> from oil and gas and power plant emissions in the area. Many of these sources are in New Mexico. Monitoring commenced in May 2008. This is an urban scale special purpose monitor. The first maximum eight hour average value recorded here in 2010 was 0.076 ppm, which is below the level of the current standard. This could change, however, when the proposed new O<sub>3</sub> standard is announced

in August 2011. It is expected to be in the range of 0.060 to 0.070 ppm. The 3-year average of the 4<sup>th</sup> maximum eight hour O<sub>3</sub> values for this site for 2008 through 2010 is 0.064 ppm.

The maximum recorded value for PM<sub>2.5</sub> in 2010 was 13.8 µg/m<sup>3</sup>.

**Aspen - Library, 120 Mill Street (08 097 0006):**

Aspen is at the upper end of a steep mountain valley. Aspen does not have an interstate running through it. Aspen was classified as nonattainment for PM<sub>10</sub>, but it is now under an attainment/maintenance plan. The valley is more restricted at the lower end, and thus forms a tighter trap for pollutants. The transient population due to winter skiing and summer mountain activities greatly increases the population and traffic during these seasons. There is also a large down valley population that commutes to work each day from as far away as the Glenwood Springs area, which is 41 miles to the northeast.

There have been several particulate monitors in the Aspen area. Only three have not been short-term special studies. The first PM<sub>10</sub> monitor began operation in June 1985. The next, the Sport Stalker, was chosen after an intense effort involving EPA, State and local agency personnel. The need was to find an acceptable middle scale location. The population oriented neighborhood scale SLAMS monitor is operating on a 1 in 3 sample schedule. The largest PM<sub>10</sub> concentration recorded at this site in 2010 was 70 µg/m<sup>3</sup>, which is below the level of the standard.

**Lamar Power Plant, 100 2<sup>nd</sup> Street (08 099 0001):**

Lamar is one of the largest cities on the eastern plains. Particulate monitoring in Lamar began in August 1975 with the installation of a TSP site at the Lamar power plant at 100 2<sup>nd</sup> Street. It operated as a TSP site until August of 1986. The first Lamar PM<sub>10</sub> site began operation in June 1985 at the power plant. In August 1986, the monitoring site was moved to the Municipal Complex (08 099 0002).

On March 19, 1976, the Lamar power plant monitor recorded a TSP concentration of 1,033 µg/m<sup>3</sup>. This is the fourth highest particulate concentration ever reported in Colorado. Lamar has regularly recorded its highest TSP and PM<sub>10</sub> levels in March. Between 1975 and 1986 the power plant monitor reported 25 concentrations greater than the 24-hour TSP NAAQS of 260 µg/m<sup>3</sup>, twelve of these occurred in March, no other month had more than three. Three of the seven exceedances of the 24-hour PM<sub>10</sub> NAAQS have also occurred in March. The primary reason for this relationship is due to the combination of low humidity and high winds that are common during the month of March. Lamar is the only Colorado city east of Denver to have been designated as a PM<sub>10</sub> nonattainment area, and is now under an attainment/maintenance plan. In 1992, the Division reinstated the power plant location as well. This was done after a review showed that levels at the power plant were generally higher than those at the City Complex. As a part of the SIP for Lamar, a meteorological site was established in 1992 at the city complex location. Analysis of these data was included as a part of the SIP process. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The highest PM<sub>10</sub> concentration recorded at this site in 2010 was 136 µg/m<sup>3</sup>, which exceeds the level of the standard.

**Lamar - Municipal Building, 104 Parmenter Street (08 099 0002):**

The Lamar Municipal site was established in January of 1996 as a more population oriented location than the Power Plant. The Power Plant site is located on the northern edge of town

while the Municipal site is near the center of the town. Both sites have recorded exceedances of the 24-hour standard of  $150 \mu\text{g}/\text{m}^3$ , and both sites regularly record values above  $100 \mu\text{g}/\text{m}^3$  as a 24-hour average. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The highest  $\text{PM}_{10}$  concentration recorded at this site in 2010 was  $95 \mu\text{g}/\text{m}^3$ , which is below the level of the standard.

**Lamar Port of Entry, 7100 US Highway 50, (08 099 0003):**

The particulate monitors in Lamar have recorded some of the highest readings in the state. These readings are primarily associated with east winds in excess of 20 mph. The Division first established a meteorological monitor in Lamar at the Municipal Building but this location was too protected and the monitor was moved to the Port of Entry location in March of 2005.

**Pueblo – Fountain School, 925 N. Glendale Ave (08 101 0015):**

Pueblo is the third largest city in the state, not counting communities that are part of Metropolitan Denver. Pueblo is principally characterized by rolling plains and moderate slopes with elevations ranging from 4,474 ft to 4,814 ft (1,364 to 1,467 m). The Rocky Mountain Front Range is about 25 miles (40 km) west and the sight of Pikes Peak is easily visible on a clear day.

Meteorologically, Pueblo can be described as having mild weather with an average of about 300 days of sunshine per year. Generally, wind blows up valley from the southeast during the day and down valley from the west at night. Pueblo experiences average wind speed ranges from 7 miles per hour in the fall and early winter to 11 miles per hour in the spring.

This site was formerly located on the roof of the Public Works Building at 211 E. D St., in a relatively flat area found two blocks northeast of the Arkansas River. At the end of June in 2010 the Public Works site was shut down and moved to the Magnet School site as the construction of a new multi-story building caused a major change in the flow dynamics of the site. The new site began operations in 2010. The distance and traffic estimate for the surrounding streets easily falls into the middle scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D.

The largest  $\text{PM}_{10}$  concentration recorded in 2010 was  $59 \mu\text{g}/\text{m}^3$ , which is lower than the level of the standard. The largest  $\text{PM}_{2.5}$  concentration here in 2010 was  $19.3 \mu\text{g}/\text{m}^3$ , which is lower than the level of the standard.

**Steamboat Springs, 136 6<sup>th</sup> Street (08 107 0003):**

Like other ski towns, Steamboat Springs has problems with wintertime inversions, high traffic density, wood smoke and street sand. These problems are exacerbated by temperature inversions that trap the pollution in the valleys.

The first site began operation in Steamboat Springs in June 1985 at 929 Lincoln Avenue. It was moved to the current location in October 1986. The 136 6<sup>th</sup> Street location not only provides a good indication of population exposure, since it is more centrally located, but it has better accessibility than the previous location. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The largest  $\text{PM}_{10}$  concentration recorded at this site in 2010 was  $99 \mu\text{g}/\text{m}^3$ , which is below the level of the standard.

**Telluride, 333 W. Colorado Avenue (08 117 0002):**

Telluride is a high mountain ski town in a narrow box end valley. The San Miguel River runs through the south end of town and the town is only about ½ mile wide from north to south. The topography of this mountain valley regime creates temperature inversions that can last for several days during the winter. Temperature inversions can trap air pollution close to the ground. Telluride sits in a valley that trends mainly east to west, which can trap air pollutants more effectively since the prevailing winds in this latitude are the westerly and the San Miguel River Valley is closed off on the east end. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

The largest PM<sub>10</sub> concentration recorded at this site in 2010 was 354 µg/m<sup>3</sup>, which exceeds the level of the standard.

**Breckenridge - 501 N. Park Avenue (08 119 0002):**

The City of Breckenridge is located in the valley of the Blue River. It is a tourist center with skiing in the winter and numerous summertime festivals and activities. The resulting wood smoke and traffic caused sufficient concern that the city of Breckenridge requested that the APCD establish PM<sub>10</sub> monitoring in the area. The Breckenridge site began operation in April 1992 and it recorded exceedances of the level of the 24-hour standard in both 2000 and in 2005. The site is currently operating on an every third day sampling schedule. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

The largest PM<sub>10</sub> concentration recorded at this site in 2010 was 80 µg/m<sup>3</sup>, which is below the level of the standard.

**Greeley - Hospital, 1516 Hospital Road (08 123 0006):**

The Greeley PM<sub>10</sub> monitor is on the roof of a hospital office building at 1516 Hospital Road. Greeley Central High School is located immediately to the east of the monitoring site. Overall, this is in an area of mixed residential and commercial development that makes it a good population exposure, neighborhood scale monitor. The distance and traffic estimate for the most controlling street easily falls into the neighborhood scale in accordance with federal guidelines found in 40 CFR, Part 58. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

Winds in this area are primarily out of the northwest, with dominant wind speeds less than 3.1 m/s. Secondary winds are from the north, north-northwest and east-southeast, with the most frequent wind speeds also being less than 3.1 m/s. The most recent available wind data for this station is for the period December 1986 to November 1987. Predominant residential growth patterns are to the west and north with large industrial growth expected to the west. There are two feedlots located about 11 miles east of the town. There was a closer feedlot on the east edge of town, but it was shut down in early 1999, after the town of Greeley purchased the land in 1997.

The largest PM<sub>10</sub> concentration recorded at this site in 2010 was 44 µg/m<sup>3</sup>, which is below the level of the standard. The largest PM<sub>2.5</sub> concentration recorded at this site in 2010 was 33.2 µg/m<sup>3</sup>, which exceeds the level of the standard. This was the only PM<sub>2.5</sub> exceedance at this site in 2010.

**Platteville, 1004 Main Street (08 123 0008):**

Platteville is located immediately west of Highway 85 along the Platte River valley bottom approximately five miles east of I -25, at an elevation of 4,825 feet. The area is characterized by relatively flat terrain and is located about one mile east of the South Platte. The National Oceanic and Atmospheric Administration operated the PROFS (Prototype Regional Observational Forecasting System) Mesonet network of meteorological monitors from the early 1990s through the mid 1990s in the northern Colorado Front Range area. Based on this data, the area around Platteville is one of the last places in the wintertime that the cold pool of air that is formed by temperature inversions burns off. This is due to solar heating. The upslope/down slope Platte River Valley drainage and wind flows between Denver and Greeley make Platteville a good place to monitor PM<sub>2.5</sub>. These characteristics also make it an ideal location for chemical speciation sampling, which began at the end of 2001.

The Platteville site is located at 1004 Main Street at the South Valley Middle School, located on the south side of town on Main Street. The school is a one-story building and it has a roof hatch from a locked interior room providing easy access to its large flat roof. There is a 2-story gym attached to the building approximately 28 meters to the Northwest of the monitor. The location of the Platteville monitor easily falls into the regional transport scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D. There are three monitors here. Two are population oriented regional scale monitors, one of which is on the SLAMS network and the other is for supplemental speciation. The SLAMS monitor is operating on a 1 in 3 day sample schedule, while the speciation monitor is operating on a 1 in 6 day schedule. The remaining monitor is a population oriented neighborhood scale supplemental speciation monitor on a 1 in 6 day sample schedule.

The largest PM<sub>2.5</sub> concentration recorded at this site in 2010 was 26.5 µg/m<sup>3</sup>, which is below the level of the standard.

**Greeley - Weld County Tower, 3101 35<sup>th</sup> Avenue (08 123 0009):**

The Weld County Tower O<sub>3</sub> monitor began operation in June 2002. The site was established after the 811 15<sup>th</sup> Street building was sold and was scheduled for conversion to other uses. The Weld County Tower site has generally recorded levels greater than the old site. This is a population oriented neighborhood scale SLAMS monitor.

The first maximum eight hour average O<sub>3</sub> concentration recorded at this site in 2010 was 0.078 ppm, which is below the level of the current standard (0.075 ppm). The 3-year average of the 4<sup>th</sup> maximum O<sub>3</sub> concentrations from 2008 through 2010 is 0.071 ppm, which is just below the level of the current standard. This will change, however, when the new O<sub>3</sub> standard is introduced in August 2011. The new standard will be in the range of 0.060 to 0.070 ppm, which would put this monitor as exceeding the standard.

**Greeley West Annex Bldg, 905 10<sup>th</sup> Avenue (08 123 0010):**

Greeley does not have the population to require a CO monitor under Federal regulation. However, it is one of the larger cities along the Front Range and was declared in nonattainment for CO in the late-1970s after exceeding the eight hour standard in 1976 and 1977. The first Greeley monitor operated from December 1976 to December 1980. It was located at 15<sup>th</sup> Street and 16<sup>th</sup> Avenue and exceeded the eight hour standard numerous times from 1976 through 1980. The monitor is a population oriented neighborhood scale SLAMS monitor.

The 811 15<sup>th</sup> Street location began operation in November 1981 and was discontinued in 2002. The current monitor is located in the Weld County West Annex building, and began operations in December 2003. This location is in the Greeley central business district (CBD). The levels recorded at this site are comparable but slightly lower than those at the former 811 15<sup>th</sup> Street site, about a quarter of the eight hour standard.

The maximum eight hour average CO concentration recorded at this site in 2010 was 2.5 ppm, which is below the level of the current standard (9 ppm). The one hour maximum CO concentration recorded at this site was 4.2 ppm, which is also well below the level of the standard (35 ppm).

## Appendix B - National Core (NCore) Monitoring Station Updates

The Colorado Department of Public Health and Environment, Air Pollution Control Division's NCore monitoring station is located on the Denver Municipal Animal Shelter (DMAS) lot at 678 S. Jason Street in Denver, Colorado. This following table and figure show the updated starting dates for monitors, as well as the updated locations of the gaseous probe inlets.

**Table 18. Parameters and Scale for the Denver Municipal Animal Shelter**

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Lat. (dec. deg.)</i>	<i>Long. (dec. deg.)</i>	<i>Elevation (m)</i>
08 031 0025	Denver Municipal Animal Shelter	678 S. Jason St.		07/2005		39.704005	-104.998113	1,594
	<b>Parameter</b>	<b>POC</b>	<b>Started</b>	<b>Orient/Scale</b>	<b>Monitor</b>	<b>Type</b>	<b>Sample</b>	
	CO (Trace)	1	04/2010	P.O. Neigh	Thermo 48i	NCore	Continuous	
	SO <sub>2</sub> (Trace)	1	01/2011	P.O. Neigh	Ecotech 9850T	NCore	Continuous	
	NO <sub>y</sub>	1	01/2011	P.O. Neigh	API 200E	NCore	Continuous	
	O <sub>3</sub>	1	04/2008	Neigh/Urban	API 400E	NCore	Continuous	
	WS/WD/Temp (U)	1	07/2008	P.O. Neigh	Met - One	NCore	Continuous	
	Relative Humidity	1	01/2011	P.O. Neigh	Rotronic	NCore	Continuous	
	Barometric Pressure	1	+			NCore	Continuous	
	Solar Radiation	1	+			NCore	Continuous	
	Precipitation	1	+			NCore	Continuous	
	Temp (L)	2	07/2008	P.O. Neigh	Met - One	NCore	Continuous	
	TSP	1	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	TSP	2	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	Pb	1	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	Pb	2	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>10</sub>	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>10</sub>	2	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM <sub>10</sub>	3	08/2005	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous	
	PM <sub>2.5</sub>	1	10/2007	P.O. Neigh	Partisol 2025	NCore	1 in 6	
	PM <sub>2.5</sub>	3	10/2007	P.O. Neigh	TEOM FDMS	SPM	Continuous	

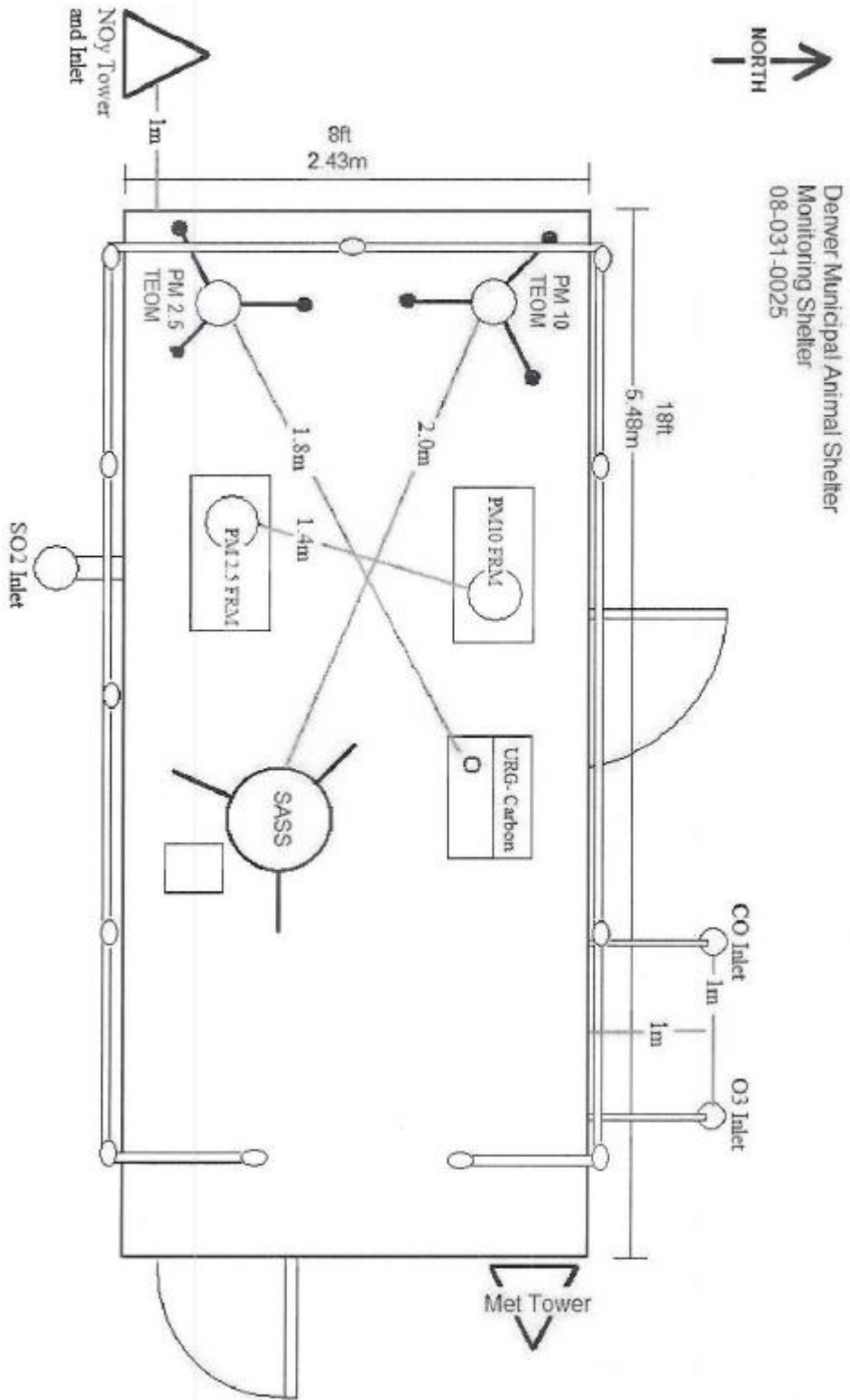


Figure 2. NCore Rooftop Sampler Layout