

COLORADO ANNUAL MONITORING NETWORK PLAN 2016



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

Prepared by the Air Pollution Control Division

Technical Services Program

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I. INTRODUCTION

The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division's (APCD) 2016 Ambient Air Monitoring Network Plan is an examination and evaluation of the APCD's network of air pollution monitoring stations. The Annual Network Plan is required by Title 40, Code of Federal Regulations, Part 58.10(a) [40 CFR 58.10(a)].¹ It is also a simple accounting of monitoring site changes that have taken place over the past year and changes that are expected for the year ahead. It is due on or before July 1st of each year.

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 reasoning for monitoring, the location of each monitor, and finally the type and frequency of measurements taken at each location. This is the ninth 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 final approval. This change was initiated due to a change in the Federal Regulations implemented in December 2006. The Colorado APCD currently operates monitors at 55 locations throughout the state of Colorado.

Overview of the Colorado Air Monitoring Network

Particulate monitors, including Particulate Matter 10 microns and smaller (PM₁₀) and Particulate Matter 2.5 microns and smaller (PM_{2.5}), and ozone monitors are the most abundant and widespread of monitoring types across the state, not taking into consideration the meteorological monitoring sites which also comprise a large portion of the CDPHE sampling network. Currently, there are PM₁₀ filter based monitors at 27 separate locations, PM_{2.5} filter based monitors at 15 locations, and ozone monitors at 22 locations. When referring to meteorological monitoring, there are 22 meteorological sites in the APCD network. These meteorological monitoring sites all monitor wind speed, wind direction, resultant speed, resultant direction, standard deviation of horizontal wind direction, and temperature. Additionally, relative humidity is also monitored at four of these locations.

Within the particulate sampling network, 8 of the 27 PM₁₀ monitoring sites have continuous monitors. There are 14 continuous PM_{2.5} monitors in the APCD network and of those, 10 of them are located at sites with filter based PM_{2.5} monitors. Only 4 continuous PM_{2.5} sites (Boulder Athens, NJH, Near Roadway Globeville and Rifle) are currently not collocated with PM_{2.5} Federal Reference Monitors (FRM). Historically, 39 of the 55 current monitoring locations have been in operation for 10 or more years, 24 of these have been in operation for 20 or more years, and 14 of the monitoring locations have been in operation for more than 30 years. Conversely, 16 of the 55 current monitoring locations have been in operation for less than 10 years. Total Suspended Particulate (TSP) monitoring ended at the end of 2014 with the removal of the lead/TSP monitor at Centennial Airport. Lead monitoring was accomplished at APCD's NCore site for two years (2012-2014) and showed very low concentrations well below the level of the standard. In 2016 lead monitoring will only be done by PM_{2.5} IMPROVE or CSN monitors and at the Grand Junction National Air Toxics Trends site within the state of Colorado.

¹ "Annual Monitoring Network Plan and Periodic Network Assessment," 40 Federal Regulations 58.10 (26 Oct. 2015).

The APCD gaseous monitoring network consists of Carbon Monoxide (CO), Ozone (O₃), Nitrogen Dioxide/Oxides of Nitrogen (NO₂/NO_y), and Sulfur Dioxide (SO₂). A majority of the gaseous monitoring conducted by the APCD occurs in the Front Range region, though there is one CO monitor that is located on the Western Slope and O₃ monitoring occurs statewide. Currently, the APCD reports data from eight CO monitor sites, twenty O₃ monitor sites, five NO₂/NO_y monitor sites, and four SO₂ monitor sites. Five of the ozone (O₃) 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, Cortez, Elk Springs and new in 2016, Paradox Basin monitoring sites. ARS keeps the sites in proper working order and performs calibrations, data retrievals, and data validation, while the APCD uploads data to the AQS database and conducts independent audits of the sites for Quality Assurance (QA) purposes. This document provides further detail of the gaseous network in the sections to follow.

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 worsening 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 21st Street and Broadway. 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 for maintenance.

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 (O₃), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂). In 1972, Colorado submitted its' first State Implementation Plan (SIP) 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 sampling network, 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 modifications to the network. These initial and subsequent modifications were made to ensure the 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, at least, a full calendar year, beginning sampling operations of new monitors in January and terminating existing monitors in December. Circumstances both in and out of the APCD's control can make that desired schedule difficult to

achieve. In addition, the APCD does not own either the land or the buildings where most of the monitors are located, and it is becoming increasingly difficult to get property owner's permission for use due to risk management issues.

When modifications to the State and Local Air Monitoring System (SLAMS) network are required, the APCD will provide EPA Region 8 with the appropriate modification forms prior to its implementation for their approval. All currently operating SLAMS monitors have been approved by EPA. With the exception of some vegetation issues or tall trees, of which APCD has received waivers from EPA, all sites currently 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. In the past, 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, such as the O₃ monitoring in Aurora, Rifle, Cortez, Aspen Park, Palisade, and Elk Springs.

The most common reasons for monitors being removed from the network are that either the land or 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. Some recent examples of this are the Auraria meteorological monitoring station and the relocation of the Denver Municipal Animal Shelter (DMAS) NCore 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 DMAS NCore site was relocated to the La Casa site due to a change in use of the 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 or if the data obtained from a site is redundant with another monitoring site.

Finally, all monitors are reviewed on a regular basis to determine if they are continuing to meet their monitoring objectives. If the population, land use, or vegetation around the monitor has changed significantly since the monitor was established, a more suitable location for the monitor may be examined. An example of this is the O₃ monitor previously located at the Arvada monitoring site. It was shut down on 1/1/2012, and relocated to the Denver – CAMP location beginning 3/1/2012.

Table 1 summarizes the locations and monitoring parameters of each site currently in operation, by county, alphabetically. The shaded lines in the table list the site name, site AQS identification number, site address, site start-up date, site elevation, and site longitude and latitude coordinates. Beneath each site description the table lists each monitoring parameter in operation at that site, the orientation and spatial scale, which national monitoring network it belongs to, the type of monitor in use, and the sampling frequency. The parameter date is the date when valid data were first collected.

The following abbreviations are used in **Table 1** below, 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	Scale (Area Represented)²
P.O. - Population oriented	Micro - Micro-scale (several m – 100 m)
Back - Background orientation	Middle - Middle Scale (100 – 500 m)
SPM - Special Purpose Monitor	Neigh - Neighborhood Scale (0.5 – 4 km)
H.C. - Highest Concentration	Urban - Urban Scale (4 – 50 km)
POC - Parameter Occurrence Code	Region - Regional Scale (50 – hundreds of km)
SLAMS - State or Local Air Monitoring Stations	

A “+” in the Start column indicates that the monitor has not yet been installed.

Table 1. Monitoring Locations and Parameters Monitored

AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
Adams							
08 001 0008	Tri County Health		4201 E 72 nd Ave.	+mid 2016	1,565	39.826007	-104.937438
	PM ₁₀	1	Anticipated Mid 2016	P.O. Neigh	Partisol 2025	SLAMS	1 in 1
	PM _{2.5} Collocated	2	Anticipated Mid 2016	P.O. Neigh	Partisol 2025	SLAMS	1 in 6
	PM _{2.5}	3	Anticipated Mid 2016	P.O. Neigh	GRIMM EDM 180	SPM	Continuous
	PM _{2.5} Speciation	5	Anticipated Mid 2016	P.O. Neigh	SASS	Trends Spec	1 in 6
	PM _{2.5} Carbon	5	Anticipated Mid 2016	P.O. Neigh	URG 3000N	Trends Spec	1 in 6
08 001 3001	Welby		3174 E. 78 th Ave.	07/1973	1,554	39.838119	-104.94984
	CO	1	07/1973	P.O. Neigh	Thermo 48C	SLAMS	Continuous
	SO ₂	2	07/1973	P.O. Neigh	TAPI 100E	SLAMS	Continuous
	NO/NO _x	2	01/1976	P.O. Urban	TAPI 200UP	SPM	Continuous
	NO ₂	1	01/1976	P.O. Urban	TAPI 200UP	SLAMS	Continuous
	O ₃	2	07/1973	P.O. Neigh	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	01/1975	P.O. Neigh	Met - One	SPM	Continuous
	PM ₁₀	1	02/1992	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀	3	06/1990	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous
Alamosa							
08 003 0001	Alamosa – Adams State College		208 Edgemont Blvd	01/1970	2,302	37.469391	-105.878691
	PM ₁₀	1	07/1989	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
08 003 0003	Alamosa – Municipal Bldg.		425 4 th St.	04/2002	2,301	37.469584	-105.863175
	PM ₁₀	1	05/2002	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1

² “Appendix D to Part 58 – Network Design Criteria for Ambient Air Quality Monitoring,” 40 Federal Register 58 (15 January 2015).

AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
Arapahoe							
08 005 0002	Highland Reservoir	8100 S. University Blvd		06/1978	1,747	39.567887	-104.957193
	O ₃	1	06/1978	P.O. Neigh	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	07/1978	P.O. Neigh	Met - One	SPM	Continuous
08 005 0005	Arapaho Community College (ACC)	6190 S. Santa Fe Dr.		12/1998	1,636	39.604399	-105.019526
	PM _{2.5}	1	03/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
08 005 0006	Aurora - East	36001 E. Quincy Ave.		04/2011	1,552	39.63854	-104.56913
	O ₃	1	04/2011	P.O. Region	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	06/2011	P.O. Neigh	Met - One	SPM	Continuous
Archuleta							
08 007 0001	Pagosa Springs School	309 Lewis St.		08/1975	2,165	37.26842	-107.009659
	PM ₁₀	3	09/1990	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
Boulder							
08 013 0003	Longmont-Municipal Bldg.	350 Kimbark St.		06/1985	1,520	40.164576	-105.100856
	PM ₁₀	2	09/1985	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀ Collocated	2	09/2014	P.O. Micro ²	SA/GMW-1200	SLAMS	1 in 6
	PM _{2.5}	1	01/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM _{2.5}	3	11/2005	P.O. Neigh	TEOM 1400ab	SPM	Continuous
08 013 0014	Boulder Reservoir	5565 N. 51 st		+Mid 2016	1,586	40.070016	-105.220238
	O ₃	1	Anticipated Mid 2016	H.C. Urban	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	Anticipated Mid 2016	H.C. Urban	Met - One	SPM	Continuous
	PM _{2.5}	3	Anticipated Mid 2016	H.C. Urban	GRIMM EDM 180	SLAMS	Continuous
	PM ₁₀	3	Anticipated Mid 2016	H.C. Urban	GRIMM EDM 180	SLAMS	Continuous
08 013 0012	Boulder Chamber of Commerce	2440 Pearl St.		12/1994	1,619	40.021097	-105.263382
	PM ₁₀	1	10/1994	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM _{2.5}	1	01/1999	P.O. Middle ³	Partisol 2025	SLAMS	1 in 3
08 013 1001	Boulder - CU - Athens	2102 Athens St.		12/1980	1,622	40.012969	-105.264212
	PM _{2.5}	3	02/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous
Delta							
08 029 0004	Delta Health Dept	560 Dodge St.		08/1993	1,511	38.739213	-108.073118
	PM ₁₀	1	05/1993	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
Denver							
08 031 0002	CAMP	2105 Broadway		01/1965	1,593	39.751184	-104.987625
	CO	2	01/1971	P.O. Micro	Thermo 48C	SLAMS	Continuous
	SO ₂	1	01/1967	P.O. Neigh	TAPI 100E	SLAMS	Continuous
	O ₃	6	03/2012	P.O. Neigh	TAPI 400E	SLAMS	Continuous
	NO/NO _x	1	01/1973	Other	TAPI 200EU	Other	Continuous
	NO ₂	1	01/1973	P.O. Neigh	TAPI 200EU	SLAMS	Continuous

AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	WS/WD/Temp	1	01/1965	P.O. Neigh	Met - One	SPM	Continuous
	PM ₁₀	1	08/1986	P.O. Micro ³	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀ Collocated	2	12/1987	P.O. Micro ³	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀	3	04/2013	P.O. Micro ³	GRIMM EDM 180	SLAMS	Continuous
	PM _{2.5}	1	01/1999	P.O. Micro ³	Partisol 2025	SLAMS	1 in 1
	PM _{2.5} Collocated	2	09/2001	P.O. Micro ³	Partisol 2025	SLAMS	1 in 6
	PM _{2.5}	3	04/2013	P.O. Micro ³	GRIMM EDM 180	SPM	Continuous
	08 031 0013	NJH-E	14 th Ave. & Albion St.		01/1983	1,620	39.738578
PM _{2.5}		3	10/2003	P.O. Neigh	TEOM FDMS	SPM	Continuous
08 031 0016	DESCI	1901 E. 13 th Ave.		12/1990	1,623	39.735700	-104.958200
	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	1,597	39.740342	-104.991037
	PM ₁₀	1	12/1992	P.O. Middle	SA/GMW-1200	SLAMS	1 in 1
08 031 0026	La Casa	4587 Navajo St.		01/2013	1,594	39.779429	-105.005174
	CO (Trace)	1	01/2012	P.O. Neigh	Thermo 48i-TLE	NCore	Continuous
	SO ₂ (Trace)	1	01/2012	P.O. Neigh	TAPI 100EU	NCore	Continuous
	NO _y	1	01/2012	P.O. Neigh	TAPI 200EU	NCore	Continuous
	CAPS NO ₂	1	07/2014	P.O. Neigh	TAPI 500U	NCore	Continuous
	O ₃	1	01/2012	Neigh/Urban	TAPI 400E	NCore	Continuous
	WS/WD/Temp	1	01/2012	P.O. Neigh	Met - One	NCore	Continuous
	Relative Humidity	1	01/2012	P.O. Neigh	Met - One	NCore	Continuous
	Temp (Lower)	2	01/2012	P.O. Neigh	Met - One	NCore	Continuous
	PM ₁₀	1	01/2012	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM ₁₀ Collocated/Pb	2	01/2012	P.O. Neigh	Partisol 2025	SLAMS	1 in 6
	PM ₁₀	3	02/2014	P.O. Neigh	GRIMM EDM 180	SLAMS	Continuous
	PM _{2.5}	1	01/2012	P.O. Neigh	Partisol 2025	NCore	1 in 3
	PM _{2.5}	3	02/2014	P.O. Neigh	GRIMM EDM 180	SLAMS	Continuous
	PM _{2.5} Speciation	5	01/2012	P.O. Neigh	SASS	Supplem. Speciation	1 in 3
PM _{2.5} Carbon	5	01/2012	P.O. Neigh	URG 3000N	Supplem. Speciation	1 in 3	
08 031 0027	I-25 Denver	971 W. Yuma Street		06/2013	1,586	39.732146	-105.015317
	CO	1	06/2013	Near Road	Thermo 48i-TLE	SLAMS	Continuous
	NO ₂	1	06/2013	Near Road	TAPI 200E	NAMS	Continuous
	NO/NO _x	1	06/2013	Near Road	TAPI 200E	SPM	Continuous

³ The CAMP PM_{2.5} site is technically a micro-scale site, but the APCD demonstrated to EPA in 2001 that the CAMP site is representative of a much larger area of similar land use, meteorology, and emissions around downtown Denver, and has therefore been justified to meet the Neighborhood scale criteria for PM_{2.5} concentrations. The same is true for the Boulder Chamber of Commerce PM_{2.5} site, which is technically a middle scale site.

AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude	
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	WS/WD/Temp	1	06/2013	Near Road	Met - One	SPM	Continuous	
	PM ₁₀	3	12/2013	Near Road	GRIMM EDM 180	SLAMS	Continuous	
	PM _{2.5}	1	01/2014	Near Road	R & P 2025	SLAMS	1 in 3	
	PM _{2.5}	3	12/2013	Near Road	GRIMM EDM 180	SPM	Continuous	
	PM _{2.5} Carbon	5	10/2013	Near Road	API 633	Supplem. Speciation	Continuous	
	Douglas							
	08 031 0028	I-25 Globeville	4905 Acoma Street		10/1/2015	1,587	39.785823	-104.988857
NO ₂ (Trace)		2	10/1/2015	Near Road	TAPI 500U	NAMS	Continuous	
NO/NO ₂ /NO _x		1	10/1/2015	Near Road	TAPI 200E	SPM	Continuous	
WS/WD/Temp/RH		1	10/1/2015	Near Road	Met - One	SPM	Continuous	
PM ₁₀		3	10/1/2015	Near Road	GRIMM EDM 180	SLAMS	Continuous	
PM _{2.5}		3	10/1/2015	Near Road	GRIMM EDM 180	SPM	Continuous	
Douglas								
08 035 0004	Chatfield State Park	11500 N. Roxborough Pk Rd		04/2004	1,676	39.534488	-105.070358	
	O ₃	1	05/2005	H.C. Urban	TAPI 400E	SLAMS	Continuous	
	WS/WD/Temp	1	04/2004	P.O. Neigh	Met - One	SPM	Continuous	
	PM _{2.5}	1	07/2005	P.O. Neigh	Partisol 2025	SPM	1 in 3	
	PM _{2.5}	3	05/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous	
El Paso								
08 041 0013	U. S. Air Force Academy	USAFA Rd. 640		05/1996	1,971	39.958341	-104.817215	
	O ₃	1	06/1996	H.C. Urban	TAPI 400E	SLAMS	Continuous	
08 041 0015	Highway 24	690 W. Hwy. 24		11/1998	1,824	39.830895	-104.839243	
	CO	1	11/1998	P.O. Micro	Thermo 48i-TLE	SLAMS	Continuous	
	SO ₂	1	01/2013	P.O. Micro	TAPI 100T	SLAMS	Continuous	
	WS/WD/Temp/RH	1	08/2014	P.O. Micro	RM Young	SPM	Continuous	
	Relative Humidity	1	08/2014	P.O. Micro	RM Young	SPM	Continuous	
08 041 0016	Manitou Springs	101 Banks Pl.		04/2004	1,955	38.853097	-104.901289	
	O ₃	1	04/2004	H.C. Neigh	TAPI 400E	SLAMS	Continuous	
08 041 0017	Colorado College	130 W. Cache La Poudre		12/2007	1,832	38.848014	-104.828564	
	PM ₁₀	1	12/2007	P.O. Neigh	Partisol 2000	SLAMS	1 in 6	
	PM _{2.5}	1	12/2007	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM _{2.5}	3	01/2008	P.O. Neigh	TEOM FDMS	SLAMS	Continuous	
Fremont								
08 043 0003	Cañon City – City Hall	128 Main St.		10/2004	1,626	38.43829	-105.24504	
	PM ₁₀	1	10/2004	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
Garfield								
08 045 0005	Parachute – Elem. School	100 E. 2nd St.		01/1982	1,557	38.453654	-108.053269	
	PM ₁₀	1	05/2000	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	WS/WD/Temp	1	03/2011	P.O. Neigh	RM Young /Vaisala	SPM	Continuous	
08 045 0007	Rifle–Henry Bldg	144 3rd St.		05/2005	1,627	39.531813	-107.782298	

AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	05/2005	P.O. Neigh	SA/GMW-1200	SPM	1 in 3
	PM _{2.5}	3	03/2015	P.O. Neigh	BAM 1020	SPM	Continuous
	WS/WD/Temp	1	09/2008	P.O. Neigh	RM Young /Vaisala	SPM	Continuous
08 045 0012	Rifle – Health Dept	195 W. 14th Ave.		06/2008	1,629	39.54182	-107.784125
	O ₃	1	06/2008	P.O. Neigh	TAPI 400E	SLAMS	Continuous
	PM _{10-2.5}	3	06/2008	P.O. Neigh	BAM-1020	SPM	Continuous
08 045 0018	Carbondale	1493 County Road 106		5/2012	1868	39.41224	-107.230413
	PM ₁₀	1	08/2012	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
Gunnison							
08 051 0004	Crested Butte	603 6th St.		09/1982	2,714	38.867595	-106.981436
	PM ₁₀	2	03/1997	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
	PM ₁₀ Collocated	3	10/2008	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
08 051 0007	Mt. Crested Butte - Realty	19 Emmons Rd.		07/2005	2,866	38.900392	-106.966104
	PM ₁₀	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
Jefferson							
08 059 0002	Arvada	9101 W. 57th Ave.		01/1973	1,640	39.800333	-105.099973
	WS/WD/Temp	1	01/1975	P.O. Neigh	Met - One	SPM	Continuous
08 059 0005	Welch	12400 W. Hwy. 285		08/1991	1,742	39.638781	-105.13948
	O ₃	1	08/1991	P.O. Urban	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	11/1991	P.O. Neigh	Met - One	SPM	Continuous
08 059 0006	Rocky Flats - N	16600 W. Hwy. 128		06/1992	1,802	39.912799	-105.188587
	O ₃	1	09/1992	H.C. Urban	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	09/1992	P.O. Neigh	Met - One	SPM	Continuous
08 059 0011	NREL	2054 Quaker St.		06/1994	1,832	39.743724	-105.177989
	O ₃	1	06/1994	H.C. Urban	TAPI 400E	SLAMS	Continuous
08 059 0013	Aspen Park	26137 Conifer Rd.		04/2011	2,467	39.540321	-105.296512
	O ₃	1	04/2011	P.O. Neigh	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	06/2011	P.O. Neigh	Met - One	SPM	Continuous
La Plata							
08 067 0004	Durango – River City Hall	1235 Camino del Rio		09/1985	1,988	37.277798	-107.880928
	PM ₁₀	1	12/2002	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
Larimer							
08 069 0009	Fort Collins – CSU - Edison	251 Edison Dr.		12/1998	1,524	40.571288	-105.079693
	PM ₁₀	1	07/1999	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
	PM ₁₀	3	06/2011	P.O. Neigh	Thermo 1405 DF	SPM	Continuous
	PM _{2.5}	1	07/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM _{2.5}	3	06/2011	P.O. Neigh	GRIMM EDM 180	SPM	Continuous
	PM _{10-2.5}	3	06/2011	P.O. Neigh	GRIMM EDM 180	SPM	Continuous
08 069 0011	Fort Collins - West	3416 La Porte Ave.		05/2006	1,571	40.592543	-105.141122
	O ₃	1	05/2006	H.C. Urban	TAPI 400E	SLAMS	Continuous

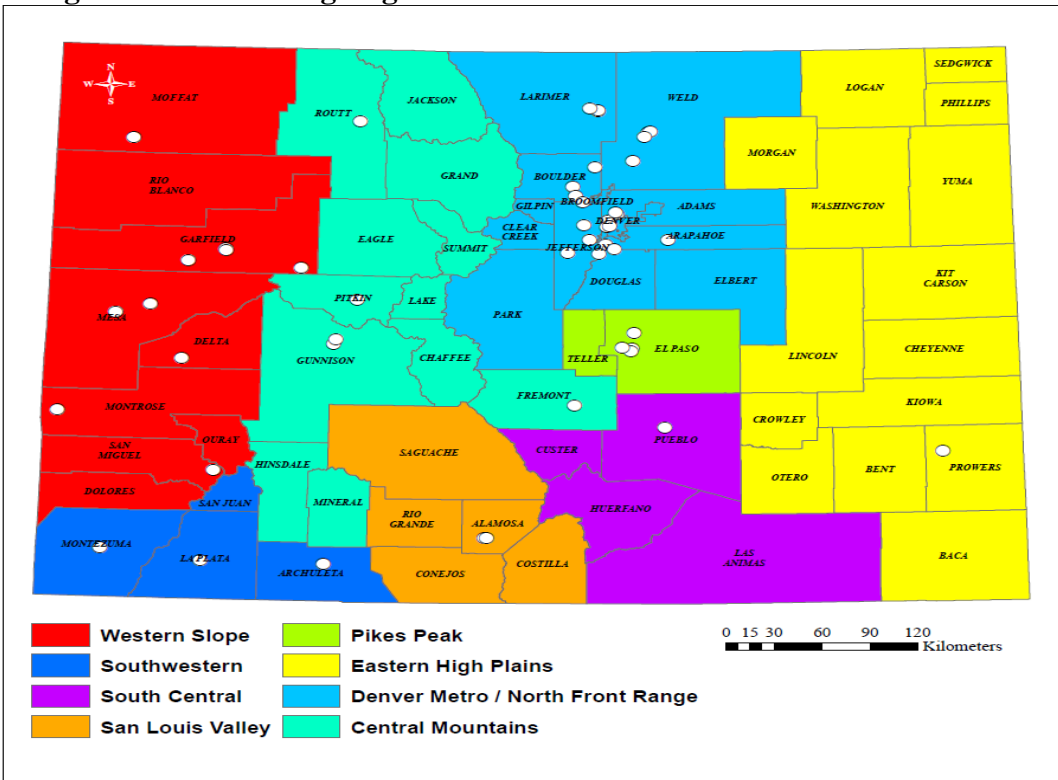
AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
08 069 1004	Fort Collins - Mason		708 S. Mason St.	12/1980	1,524	40.57747	-105.07892
	CO	1	12/1980	P.O. Neigh	Thermo 48C	SLAMS	Continuous
	O ₃	1	12/1980	P.O. Neigh	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	01/1981	P.O. Neigh	Met - One	SPM	Continuous
Mesa							
08 077 0017	Grand Junction – Powell Bldg		650 South Ave.	02/2002	1,398	39.063798	-108.561173
	PM ₁₀ & NATTS Toxic Metals	3	01/2005	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM ₁₀ Collocated & NATTS	4	03/2005	P.O. Neigh	Partisol 2000	SLAMS	1 in 6
	PM _{2.5}	1	11/2002	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM ₁₀	3	01/2014	P.O. Neigh	GRIMM EDM 180	SPM	Continuous
	PM _{2.5}	3	01/2014	P.O. Neigh	GRIMM EDM 180	SPM	Continuous
	PM _{10-2.5}	3	01/2014	P.O. Neigh	GRIMM EDM 180	SPM	Continuous
08 077 0018	Grand Junction - Pitkin		645 1/4 Pitkin Ave.	01/2004	1,398	39.064289	-108.56155
	CO	1	01/2004	P.O. Micro	Thermo 48C	SLAMS	Continuous
	WS/WD/Temp	1	01/2004	P.O. Neigh	MetOne/RM Young	SPM	Continuous
	Relative Humidity	1	01/2004	P.O. Neigh	RM Young	SPM	Continuous
08 077 0020	Palisade Water Treatment		Rapid Creek Rd.	05/2008	1,512	39.130575	-108.313853
	O ₃	1	04/2008	P.O. Urban	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	04/2008	P.O. Neigh	RM Young	SPM	Continuous
Moffat							
08 081 0003	Elk Springs		33902 Old US Hwy. 40	08/2015	1,902	40.329253	-108.494240
	O ₃	1	08/2015	BG Regional	TAPI 400E	SPM	Continuous
	WS/WD/Temp	1	08/2015	BG Regional	RM Young	SPM	Continuous
Montezuma							
08 083 0006	Cortez – Health Dept		106 W. North St.	06/2006	1,890	37.350054	-108.592337
	O ₃	1	06/2008	P.O. Urban	TAPI 400E	SLAMS	Continuous
Montrose							
08 085 0005	Paradox		7250 County Rd. 5	03/2016	1,584	38.342743	-108.944950
	O ₃	1	03/2016	BG Regional	Thermo 49C	SPM	Continuous
	WS/WD/Temp	1	03/2016	BG Regional	RM Young	SPM	Continuous
Pitkin							
08 097 0006	Aspen – Yellow Brick		215 N. Garmisch St.	01/2015	2,408	39.192958	-106.823257
	PM ₁₀	1	02/2015	P.O. Neigh	SA/GWM 1200	SLAMS	1 in 3
Prowers							
08 099 0002	Lamar Municipal		104 E. Parmenter St.	12/1976	1,107	38.084688	-102.618641
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
08 099 0003	Lamar Port of Entry		7100 US Hwy. 50	03/2005	1,108	38.113792	-102.626181
	WS/WD/Temp	1	03/2005	P.O. Neigh	Met - One	SPM	Continuous

AQS #	Site Name	Address		Started	Elevation (m)	Latitude	Longitude
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
Pueblo							
08 101 0015	<i>Pueblo – Fountain School</i>	925 N. Glendale Ave.		06/2011	1,433	38.276099	-104.597613
	PM ₁₀	1	04/2011	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
	PM _{2.5}	1	04/2011	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
Routt							
08 107 0003	<i>Steamboat Springs</i>	136 6th St.		09/1975	2,054	40.485201	-106.831625
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
San Miguel							
08 113 0004	<i>Telluride</i>	333 W. Colorado Ave.		03/1990	2,684	37.937872	-107.813061
	PM ₁₀	1	03/1990	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
Weld							
08 123 0006	<i>Greeley-Hospital</i>	1516 Hospital Rd.		04/1967	1,441	40.414877	-104.70693
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
	PM _{2.5}	1	02/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM _{2.5}	3	02/1999	P.O. Neigh	TEOM – 1400ab	SPM	Continuous
08 123 0008	<i>Platteville Middle School</i>	1004 Main St.		12/1998	1,469	40.209387	-104.82405
	PM _{2.5}	1	08/1999	P.O. Region	Partisol 2025	SLAMS	1 in 3
	PM _{2.5} Speciation	5	08/1999	P.O. Region	SASS	Spec Trends	1 in 6
	PM _{2.5} Carbon	5	04/2011	P.O. Neigh	URG 3000N	Spec Trends	1 in 6
08 123 0009	<i>Greeley –County Tower</i>	3101 35th Ave.		06/2002	1,484	40.386368	-104.73744
	O ₃	1	06/2002	H.C. Neigh	TAPI 400E	SLAMS	Continuous
	WS/WD/Temp	1	02/2012	P.O. Neigh	Met – One	SPM	Continuous
	CO	1	04/2016	P.O. Neigh	Thermo 48i-TLE	SLAMS	Continuous

Description of Monitoring Areas in Colorado

The state has been divided into eight multi-county areas that are generally based on topography and have similar airshed characteristics. These areas are the Central Mountains, Denver Metro/North Front Range, Eastern High Plains, Pikes Peak, San Luis Valley, South Central, Southwestern, and Western Slope regions. **Figure 1** shows the approximate boundaries of these areas.

Figure 1. Monitoring Regions in Colorado



Central Mountains Region

The Central Mountains Region consists of 12 counties in the central area of the state. The Continental Divide passes through much of this region. Mountains and mountain valleys are the dominant landscape. Leadville, Steamboat Springs, Cañon City, Salida, Buena Vista and Aspen represent the larger communities. The population of this region is approximately 255,043 according to U.S. Census Bureau 2015 estimates. Skiing, tourism, ranching, mining, and correctional facilities are the primary industries. Black Canyon of the Gunnison National Park is located in this region. All of the area complies with federal air quality standards.

The primary monitoring concern is with particulate pollution from wood burning and road sanding. Currently, there are no gaseous and four particulate monitoring sites operated by the APCD in the Central Mountains region.

Denver Metro/North Front Range Region

The Denver-Metro/North Front Range Region encompasses the 13 counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, Larimer, Weld, and Park. It includes the largest population area in the state according to 2015 estimates, with approximately 3,068,024 people living in the eleven-county Denver-metro area and another 601,992 people living in the northern Colorado area of Larimer and Weld counties. This area includes Rocky Mountain National Park and several wilderness areas.

Since 2002, the region has complied with all National Ambient Air Quality Standards, except for ozone. The area has been exceeding the federal ozone standards since the early 2000s, and in 2007 was formally designated as a “nonattainment” area for the 1997 ozone standard. This

nonattainment designation was re-affirmed in 2012 when the EPA classified the region as a “marginal” nonattainment area for the 2008 ozone standard. The region recently failed to attain the 2008 ozone standard and will be moved up to the next level of classification, a moderate area. A moderate area ozone implementation plan is currently being developed by the APCD and will be submitted to the EPA in 2017. The EPA released a more stringent ozone standard on October 1, 2015. Colorado plans to submit area designation recommendations within one year of this promulgation, based on the 2013-2015 monitoring data period. The EPA will finalize area designations in 2017. Depending on the monitoring data levels and the associated nonattainment area classification a State Implementation Plan might be due three years from the promulgation date of the standard.

In the past, the Denver-metropolitan area violated health-based air quality standards for carbon monoxide and fine particles. In response, the Regional Air Quality Council, the Colorado Air Quality Control Commission and the Air Pollution Control Division developed, adopted and implemented air quality improvement plans to reduce each of the pollutants.

For the rest of the Northern Front Range, Fort Collins, Longmont, and Greeley were nonattainment areas for carbon monoxide in the 1980s and early 1990s, but have met the federal standards since 1995. Air quality improvement plans have been implemented for each of these communities.

Currently, there are twenty-eight gaseous pollutant monitors at seventeen sites and thirty-three particulate monitors at sixteen sites in the Northern Front Range Region. There are six CO, fourteen O₃, five NO₂, one NO_y, and three SO₂ monitoring sites. There are sixteen PM₁₀ monitors at 10 sites and twenty-three PM_{2.5} monitors at thirteen sites, keeping in mind that the 1405's and the GRIMM's monitor continuously for both PM_{2.5} and PM₁₀ and co-located samplers are also included in the total number of samplers operated by the APCD. There are two air toxics monitoring sites, one located at CAMP, and one at Platteville. In addition, there is one site that measures suspended particulates and visual range by use of a nephelometer and a transmissometer.

Eastern High Plains Region

The Eastern High Plains region encompasses the counties on the plains of eastern Colorado. The area is semiarid and often windy. The area's population is approximately 143,588 according to 2015 U.S. Census Bureau estimates. Its major urban centers have developed around farming, ranching and trade centers such as Sterling, Fort Morgan, Limon, La Junta, and Lamar. The agricultural base includes both irrigated and dry land farming. With concurrences by EPA on the Exceptional Event Reports for high wind dust events submitted by the APCD, all of the Eastern High Plains Region complies with federal air quality standards.

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 in the past for particulates. Along the I-70 corridor only the community of Limon has been monitored for particulates. Along the US-50/Arkansas River corridor the APCD has monitored for particulates in the communities of La Junta and Rocky Ford. 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 High Plains Region there is currently one PM₁₀ monitoring site in Lamar and no gaseous pollutant monitoring sites in the area. A replacement site for the Elbert PM_{2.5} background site was installed at Castlewood Canyon in Douglas County in 2014. This site was in the Denver Metro/Northern Front Range region, but was discontinued as of 12/31/2014 due to APCD finding a more cost effective way to monitor background PM_{2.5} concentrations through IMPROVE monitors. The IMPROVE monitors are a National Park Service network that operates in park and wilderness areas, with a focus on monitoring visual air quality (visibility).

Pikes Peak Region

The Pikes Peak Region includes El Paso and Teller counties. The area has a population of approximately 702,925 according to 2015 U.S. Census Bureau estimates. Eastern El Paso County is rural prairie, while the western part of the region is mountainous. All of the area complies with federal air quality standards.

The U.S. Government is the largest employer in the area, and major industries include Fort Carson and the U.S. Air Force Academy in Colorado Springs, both military installations. Aerospace and technology are also large employers in the area.

Currently, there are four gaseous pollutants monitored at three sites and one particulate monitoring site in the Pikes Peak Region. There is one CO, one SO₂, and two O₃ gaseous monitors in this region, as well as one PM₁₀ and two PM_{2.5} monitors in the region. There is also one meteorological monitoring site in the region operated by the APCD.

San Luis Valley Region

Colorado's San Luis Valley Region is in the south central portion of Colorado and includes a broad alpine valley situated between the Sangre de Cristo Mountains on the northeast and the San Juan Mountains of the Continental Divide to the west. The valley is some 71 miles wide and 122 miles long, extending south into New Mexico. The average elevation is 7,500 feet. Principal towns include Alamosa, Monte Vista and Del Norte. The population is approximately 48,303 according to 2015 U.S. Census Bureau estimates. Agriculture and tourism are the primary industries. The valley is semiarid and croplands of potatoes, head lettuce, and barley are typically irrigated. The valley is home to Great Sand Dunes National Park.

The air quality planning region consists of Saguache, Rio Grande, Alamosa, Conejos and Costilla counties. With concurrences by EPA on the Exceptional Event Reports submitted by the APCD, all of the San Luis Valley Region complies with federal air quality standards.

Currently, there are no gaseous and two PM₁₀ monitoring sites in the area.

South Central Region

The South Central Region is comprised of Pueblo, Huerfano, Las Animas and Custer counties. Its population is approximately 201,360 according to 2015 U.S. Census Bureau estimates. Urban centers include Pueblo, Trinidad and Walsenburg. The region has rolling semiarid plains to the east and is mountainous to the west. All of the area complies with federal air quality standards.

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 no gaseous pollutant monitoring sites and one particulate monitoring site

in the South Central Region. There is one site in Pueblo that monitors for both PM₁₀ and PM_{2.5}.

Southwest Region

The Southwestern Region includes the Four Corners area counties of Montezuma, La Plata, Archuleta and San Juan. The population of this region is approximately 101,670 according to 2015 U.S. Census Bureau estimates. The landscape includes mountains, plateaus, high valleys and canyons. Durango and Cortez are the largest towns, while lands of the Southern Ute and Ute Mountain Ute tribes make up large parts of this region. The region is home to Mesa Verde National Park. Tourism and agriculture are the dominant industries. Though the oil and gas industry is growing in this area, all of the area complies with federal air quality standards.

Currently there is one gaseous and three particulate monitoring stations in the region operated by APCD. There is one O₃ monitor and two PM₁₀ monitors. The PM_{2.5} monitor in Cortez Colorado was decommissioned in July of 2015. The monitor recorded low concentrations and had met its monitoring goals.

Western Slope Region

The Western Slope Region includes nine counties on the far western border of Colorado. A mix of mountains on the east, with mesas, plateaus, valleys and canyons to the west form the landscape of this region. Grand Junction is the largest urban area, and other cities include Telluride, Montrose, Delta, Rifle, Glenwood Springs, Meeker, Rangely, and Craig. The population of this region is approximately 309,660 according to 2015 U.S. Census Bureau estimates. Primary industries include ranching, agriculture, mining, energy development and tourism. Dinosaur and Colorado National Monuments are located in this region.

The Western Slope, along with the central mountains, are projected to be the fastest growing areas of Colorado through 2020 with greater than two percent annual population increases, according to the Colorado Department of Local Affairs. All of the area complies with federal air quality standards.

Currently, there are three gaseous pollutant monitoring sites and six particulate monitoring sites in the Western Slope region operated by the APCD. There is one CO location, two O₃ monitoring sites, six PM₁₀, and one PM_{2.5} monitoring site operated by APCD in this region.

State-wide Population Statistics

Table 2 is a listing of the projected population statistics by county based on 2015 estimates. 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, February 28, 2013), and Sub-state Regions. 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 by County and Metropolitan Statistical Area

REGION / MSA / COUNTY	Actual Population	Projected Population		Avg. Annual % Change	
	July 2010	July 2015	July 2020	2010 -15	2010 -20
<i>COLORADO</i>	5,029,196	5,474,968	5,999,989	1.8%	1.9%
CENTRAL MOUNTAINS	225,907	255,043	288,527	2.6%	2.8%
Chaffee	17,809	19,862	23,052	2.3%	2.9%
Eagle	52,197	61,846	71,076	3.7%	3.6%
Fremont	46,824	50,456	54,217	1.6%	1.6%
Grand	14,843	16,989	20,090	2.9%	3.5%
Gunnison	15,324	16,457	17,895	1.5%	1.7%
Hinsdale	843	928	1,027	2.0%	2.2%
Jackson	1,394	1,507	1,598	1.6%	1.5%
Lake	7,310	8,424	9,642	3.0%	3.2%
Mineral	712	804	870	2.6%	2.2%
Pitkin	17,148	19,394	21,929	2.6%	2.8%
Routt	23,509	25,706	28,563	1.9%	2.1%
Summit	27,994	32,670	38,568	3.3%	3.8%
DENVER METRO / NORTH FRONT RANGE	3,390,504	3,679,013	4,023,313	1.6%	1.7%
<i>BOULDER MSA / BOULDER</i>	294,567	312,668	332,107	1.2%	1.3%
<i>DENVER-AURORA-LAKEWOOD MSA</i>	2,543,482	2,755,356	2,999,591	1.7%	1.8%
Adams	441,603	491,263	544,258	2.2%	2.3%
Arapahoe	572,003	619,762	673,230	1.7%	1.8%
Broomfield	55,889	63,926	71,211	2.9%	2.7%
Clear Creek	9,088	9,757	10,710	1.5%	1.8%
Denver	600,158	645,364	686,613	1.5%	1.4%
Douglas	285,465	322,985	373,308	2.6%	3.1%
Elbert	23,086	28,266	38,173	4.5%	6.5%
Gilpin	5,441	5,972	6,519	2.0%	2.0%
Jefferson	534,543	548,447	571,753	0.5%	0.7%
Park County	16,206	19,614	23,816	4.2%	4.7%
<i>FORT COLLINS MSA / LARIMER</i>	299,630	325,776	360,274	1.7%	2.0%
<i>GREELEY MSA / WELD</i>	252,825	285,216	331,341	2.6%	3.1%
EASTERN HIGH PLAINS	137,009	143,588	151,837	1.0%	1.1%
Baca	3,788	3,822	3,893	0.2%	0.3%
Bent	6,499	6,657	6,832	0.5%	0.5%
Cheyenne	1,836	1,940	2,082	1.1%	1.3%
Crowley	5,823	6,234	6,643	1.4%	1.4%
Kiowa	1,398	1,458	1,509	0.9%	0.8%
Kit Carson	8,270	8,643	8,893	0.9%	0.8%
Lincoln	5,467	5,787	6,193	1.2%	1.3%

REGION / MSA / COUNTY	Actual Population	Projected Population		Avg. Annual % Change	
	July 2010	July 2015	July 2020	2010 -15	2010 -20
Logan	22,709	23,873	25,734	1.0%	1.3%
Morgan	28,159	29,772	32,209	1.1%	1.4%
Otero	18,831	19,813	20,802	1.0%	1.0%
Phillips	4,442	4,540	4,670	0.4%	0.5%
Prowers	12,551	13,065	13,633	0.8%	0.9%
Sedgwick	2,379	2,542	2,689	1.4%	1.3%
Washington	4,814	4,948	5,054	0.6%	0.5%
Yuma	10,043	10,494	11,001	0.9%	1.0%
PIKES PEAK	645,613	702,925	763,004	1.8%	1.8%
COLORADO SPRINGS MSA	645,613	702,925	763,004	1.8%	1.8%
El Paso	622,263	677,353	734,862	1.8%	1.8%
Teller	23,350	25,572	28,142	1.9%	2.1%
SAN LUIS VALLEY	45,315	48,303	51,972	1.3%	1.5%
Alamosa	15,445	16,505	17,860	1.4%	1.6%
Conejos	8,256	8,773	9,253	1.3%	1.2%
Costilla	3,524	3,726	3,871	1.1%	1.0%
Rio Grande	11,982	12,812	13,887	1.4%	1.6%
Saguache	6,108	6,487	7,101	1.2%	1.6%
SOUTH CENTRAL	185,536	201,360	217,304	1.7%	1.8%
Custer	4,255	4,991	5,866	3.5%	3.8%
Huerfano	6,711	6,996	7,527	0.8%	1.2%
Las Animas	15,507	19,346	19,217	5.0%	2.4%
PUEBLO MSA / PUEBLO	159,063	170,027	185,227	1.4%	1.6%
SOUTHWEST	89,652	101,670	115,796	2.7%	2.9%
Archuleta	12,084	14,348	17,127	3.7%	4.2%
La Plata	51,334	58,404	66,714	2.8%	3.0%
Montezuma	25,535	28,160	31,171	2.1%	2.2%
San Juan	699	758	784	1.7%	1.2%
WESTERN SLOPE	309,660	345,062	387,704	2.3%	2.5%
Delta	30,952	35,724	41,311	3.1%	3.3%
Dolores	2,064	2,247	2,436	1.8%	1.8%
Garfield	56,389	65,124	76,939	3.1%	3.6%
Grand Junction MSA / Mesa	146,723	157,878	171,581	1.5%	1.7%
Moffat	13,795	14,672	15,464	1.3%	1.2%
Montrose	41,276	47,541	54,718	3.0%	3.3%
Ouray	4,436	5,220	5,832	3.5%	3.1%
Rio Blanco	6,666	7,827	9,056	3.5%	3.6%
San Miguel	7,359	8,829	10,367	4.0%	4.1%

II. Carbon Monoxide (CO)

In 2016, the APCD will operate eight CO monitors. Currently, the NAAQS for CO are primary standards, 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 2.8 ppm in 2015. 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 EPA requirements under the Code of Federal Regulations (CFR). However, the EPA has revised the minimum requirements for CO monitoring by requiring CO monitors to be sited near roads in certain urban areas. They are requiring a CO monitor to be located at one near-roadway NO₂ monitoring site. EPA is also specifying that monitors required in metropolitan areas (Core Based Statistical – CBSAs) of 2.5 million or more persons are to be operational by January 1, 2015, and that monitors required in CBSAs of one million or more persons are required to be operational by January 1, 2017. Currently, a CO monitor is located at the I-25 Denver near roadway NO₂ site to satisfy these requirements.

Denver Metro/Northern Front Range Region

The three major urban centers in the Northern Front Range Region include the greater Denver Metro area, and the Fort Collins and Greeley areas located in Larimer and Weld counties respectively. Mobile sources are the main contributor to elevated CO in the Front Range region. However, controlled burns/wild fires and biogenic influences, including oil and gas development, may also contribute to elevated CO levels. Weld County is also located in an area of significant oil and gas development.

Table 3 lists the maximum eight-hour and one-hour concentrations recorded in 2015 for the Northern Front Range region while, **Table 4** lists the same values for monitoring stations in the Denver Metro area for the same time period.

Table 3. Maximum CO Concentrations in Northern Front Range

Site ID	Site Name	Eight-Hour Max (ppm)	One-Hour Max (ppm)
08 069 1004	Fort Collins-Mason	2.1	4.7
08 123 0009	Weld County Tower	0.9*	3.7*
08 123 0010	Greeley Annex	2.8*	3.3*

*Weld County Tower (08-123-0009) began monitoring for CO in Aug. of 2015. Greeley Annex site (08-123-0010) was shut down in June of 2015. See detailed explanation in “Planned Changes in CO Monitoring” below.

Table 4. Maximum CO Concentrations in Denver Area

Site ID	Site Name	Eight-Hour Max (ppm)	One-Hour Max (ppm)
08 001 3001	Welby	2.0	3.10
08 031 0002	CAMP	2.4	2.80
08 031 0026	La Casa	2.4	2.85
08 031 0027	I-25 Denver	2.4	2.91

It should be noted here that the I-25-Denver, and La Casa monitors are trace level monitors, while the others are not. The monitor located at the Welby site is an EPA Regional Administrator Required Monitor.

Pikes Peak Region

The Pikes Peak Region is a very popular tourist area with rapid urban growth. In 2013 the CO analyzer was upgraded from a 48c to a 48iTLE analyzer. The TLE indicates the analyzer is capable of trace-level CO detection, which increases the resolution of low concentrations detected by an order of magnitude. In 2015, the highest eight-hour CO concentration recorded at the Colorado Springs-Hwy 24 monitor was 2.5 ppm with a maximum one-hour concentration of 3.18 ppm.

The CO monitor in this area is located at:

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

Western Slope Region

Population in the Western Slope region is not evenly distributed among the counties and ranges from 148,255 people in Mesa County to 7,840 in San Miguel County, according to the April 2014 census data. Grand Junction is the largest city on the western slope with an estimated 2013 population of 59,778 (April 2010). This is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

In 2015, the highest eight-hour CO concentration recorded at the Grand Junction – Pitkin monitor was 0.9 ppm with a one-hour maximum concentration of 1.4 ppm.

The CO monitor in this area is located at:

08-077-0018 Grand Junction - Pitkin, 645 ¼ Pitkin Ave.

Planned Changes in CO Monitoring

In 2016, there are no planned changes for the CO network operated by APCD. The Greeley – Annex CO monitor was relocated to the Greeley – Weld County Tower monitoring site in June of 2015 due to building use changes and property access issues. The CO monitor at Weld County Tower was switched from a Thermo 48C to a Thermo 48i-tle trace level analyzer on April 28th, 2016. There are no other changes to the CO monitoring network at this time.

III. Ozone (O₃)

On March 12, 2008, the U.S. Environmental Protection Agency promulgated a new level of the NAAQS for O₃ of 0.075 ppm as an annual fourth-highest daily maximum eight-hour concentration, averaged over three years. This made a significant change in the number of O₃ monitors that violate the standard.

On October 1st, 2015, the EPA strengthened the NAAQS for ground level ozone to 0.070 ppm (effective Dec. 28th, 2015). The APCD operates four sites out of 17 that have three-year design values (2013 – 2015) in excess of the current eight-hour O₃ NAAQS standard of 0.075 ppm (note that because the 8 hour ozone standard is calculated based on looking back on three years of data, the calculations for 2015 will be based on the 0.075 ppm value). These sites are: Chatfield State Park (0.079 ppm), Rocky Flats North (0.079 ppm), National Renewable Energy

Laboratory or NREL (0.080 ppm) and Fort Collins West (0.077 ppm).

EPA’s monitoring requirements for O₃ include placing a certain number of monitors in areas with high populations. For example, in Metropolitan Statistical Areas (MSAs) with a population greater than ten million people, EPA recommends the placement of at least four monitors in areas with design value concentrations that are greater than or equal to 85% of the O₃ standard. The largest MSA in Colorado is the Denver-Aurora-Lakewood Primary Metropolitan Statistical Area (PMSA). This PMSA includes the counties of Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park. There are seven different MSAs in Colorado. **Table 5** lists EPA’s O₃ monitoring requirements. Each MSA is discussed further in the following subsections.

Table 5. EPAs Minimum Ozone Monitoring Requirements

MSA population ^{1,2}	Most recent 3-year design value concentrations \geq 85% of any O ₃ NAAQS ³	Most recent 3-year design value concentrations < 85% of any O ₃ NAAQS ^{3,4}
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000 ⁵	1	0

¹Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

²Population based on latest available census figures.

³The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR Part 50.

⁴These minimum monitoring requirements apply in the absence of a design value.

⁵Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

In addition to the above mentioned O₃ monitoring requirements, EPA rules also state that there must be at least one monitoring site per MSA that monitors for the highest concentrations. There are seven MSA areas in Colorado. They are the Denver-Aurora-Lakewood, Boulder, Fort Collins, Greeley, Colorado Springs, Grand Junction, and Pueblo MSAs.

Denver Metro/Northern Front Range

Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors and chemical solvents are some of the major sources of NO_x and Volatile Organic Compounds (VOCs) in the atmosphere. In the presence of sunlight, NO_x and VOCs chemically react to form ground level ozone.

In the Northern Front Range, the first and fourth maximum eight-hour concentrations recorded in 2015 for each O₃ monitoring site in Larimer and Weld Counties are listed in the **Table 6**. Also listed in the table below are the three-year design values (2013-2015) for each site

with enough data available to calculate them. Weld County is an area of significant oil and gas development which potentially contributes to ozone forming compounds or “precursors” in the lower atmosphere. There are two MSAs located in Larimer and Weld counties. These are the Fort Collins MSA, and the Greeley MSA. According to the 2010 Census for projected populations for 2015, their populations in 2015 are projected to be 325,776 and 285,216 respectively. Per EPA monitoring requirements, these MSAs fall in the 50,000 to 350,000 population range and each area requires at least one highest concentration O₃ monitor. These requirements are satisfied by the monitors listed below. The monitor located at the Fort Collins – West site is a highest concentration monitor for the Fort Collins MSA, and the Greeley – Tower monitor serves the same purpose for the Greeley MSA. Design values that are **bold** and *italicized* exceed the NAAQS.

Table 6. Maximum O₃ Concentrations in Northern Front Range Region

Site ID	Site Name	1 st eight-hour Max (ppm)	4 th eight-hour Max (ppm)	2013 - 2015 Design Value (ppm)
08 069 0011	Fort Collins – West	0.080	0.075	<i>0.077</i>
08 069 1004	Fort Collins – Mason	0.076	0.069	0.071
08 123 0009	Greeley – Tower	0.077	0.073	0.072

In the Denver Metro area, only Adams, Arapahoe, Boulder, Denver, Douglas, and Jefferson counties have O₃ monitors. There are 10 monitors currently in operation in this area. The first and fourth maximum eight-hour concentrations recorded in 2015 for each O₃ monitoring site in the metropolitan Denver area are listed in **Table 7** below. Also listed are the three-year design values (2013-2015) for each site with enough data available to calculate them.

There are two MSAs located in the Metropolitan Denver area. These are the Boulder MSA, and the Denver-Aurora-Lakewood MSA. According to the 2010 Census for 2015 population projections, their populations are projected to be 312,668 and 2,755,356 respectively. Per EPA monitoring requirements, the Boulder MSA falls in the 50,000 to 350,000 population range, and the Denver-Aurora-Lakewood MSA falls in the 350,000 to 4,000,000 range. The Boulder MSA therefore requires at least one monitor, which was satisfied by the monitor at South Boulder Creek. The South Boulder Creek monitor was shut down Jan. 1st 2016 because it did not meet siting requirements due to large trees that have become overgrown and cannot be removed. A new Boulder ozone site is being established at the Boulder Reservoir and should be operational mid- 2016. By EPA rules, the Denver-Aurora-Lakewood MSA requires at least two monitors. This requirement is satisfied by the remaining nine monitors that are placed throughout the Denver-Aurora-Lakewood MSA. The monitors located at Chatfield, Rocky Flats – North, and NREL are all highest concentration monitors for the Denver-Aurora-Lakewood MSA. The monitor located at the Welby site is a Regional Administrator Required Monitor.

Table 7. Maximum O₃ Concentrations in the Denver Metro Area

Site ID	Site Name	1 st Eight-hour Max (ppm)	4 th Eight-hour Max (ppm)	2013-2015 Design Value (ppm)
08 001 3001	Welby	0.075	0.069	0.071
08 005 0006	Aurora – East	0.081	0.068	0.069
08 013 0011	South Boulder Creek	0.079	0.074	0.074
08 031 0002	CAMP	0.077	0.067	0.065
08 031 0026	La Casa	0.080	0.071	0.069
08 035 0004	Chatfield State Park	0.093	0.081	<i>0.079</i>
08 059 0005	Welch	0.085	0.075	0.073
08 059 0006	Rocky Flats – N	0.081	0.077	<i>0.079</i>
08 059 0011	NREL	0.091	0.081	<i>0.080</i>
08 059 0013	Aspen Park	0.074	0.070	0.070

Three of the ten monitors have concentrations greater than the level of the 2008 8-hour NAAQS standard for ozone. Their values are bolded and italicized to highlight them. Of the seven remaining sites, two are within 0.002 ppm of reaching the standard limit.

Pikes Peak Region

The first and fourth maximum eight-hour concentrations recorded in 2015 for each O₃ monitoring site in the Pikes Peak Region are listed in **Table 8** below. Also listed are the three year design values (2013-2015) for each site.

There is one MSA located in the Pikes Peak Region, the Colorado Springs MSA. According to the 2010 Census data, the projected 2015 population is 702,925. Per EPA monitoring requirements the Colorado Springs MSA falls in the 350,000 to 4,000,000 range and therefore requires at least two monitors. This is satisfied by the monitors at the Air Force Academy and Manitou Springs.

Table 8. Maximum O₃ Concentrations in Pikes Peak Region

Site ID	Site Name	1 st Eight-hour Max (ppm)	4 th Eight-hour Max (ppm)	2013-2015 Design Value (ppm)
08 041 0013	U.S. Air Force Academy	0.072	0.067	0.068
08 041 0016	Manitou Springs	0.070	0.065	0.066

Western Slope Region

The first and fourth maximum eight-hour concentrations recorded in 2015 for each O₃ monitoring site in the Western Slope Region are listed in **Table 9** below. Also listed are the three year design values (2013-2015) for each site. None of these sites recorded ozone concentrations that exceeded the 8-hour ozone standard. The Lay Peak site was established in August of 2011 and was removed from the network at the end of 2014 due to the site meeting its monitoring objectives. The data for Lay Peak is not listed below, because the APCD no longer collects data from this site as of Jan. 1st, 2015. One of the recommendations of the 3-State Study Network Assessment was to locate the Lay Peak site further to the west and to the North. So in

response to that recommendation, APCD shut down the Lay Peak site and moved it to Elk Springs. The Elk Springs Site started monitoring for ozone and meteorology on Aug. 1st, 2015.

There is one MSA located on the Western Slope. It is the Grand Junction MSA, which includes all of Mesa County. Per EPA monitoring requirements, this MSA falls in the 50,000 to 350,000 population range, and requires one O₃ monitor. The monitor at the Palisade Water Treatment Plant satisfies this requirement, as well as the highest concentration monitor requirement.

Table 9. Maximum O₃ Concentrations in the Western Slope Region

Site ID	Site Name	1 st Eight-hour Max (ppm)	4 th Eight-hour Max (ppm)	2013-2015 Design Value (ppm)
08 045 0012	Rifle – Health	0.070	0.068	0.063
08 077 0020	Palisade Water Treatment	0.070	0.065	0.066
08 081 0003	Elk Springs	0.063*	0.055*	-----

*The Elk Springs site began monitoring for ozone August 1st, 2015.

Southwest Region

There is a single O₃ monitor in the Southwest Region in Cortez. The first and fourth eight-hour maximum concentrations in 2015 were 0.065 and 0.061 ppm respectively, and the 2013-2015 design value is 0.062.

The O₃ monitor in Cortez is:

08 083 0006 – Cortez 106 W. North Street

Planned Changes in O₃ Monitoring

The following changes to CDPHE’s ozone monitoring network are planned for 2016.

- A new location for the South Boulder Creek monitoring station has been secured at the Boulder Reservoir. The South Boulder Creek site no longer meets siting criteria due to the presence of large trees near the station that cannot be removed. The South Boulder Creek site stopped monitoring Dec. 31st, 2015. The new site should be operational in mid 2016 (see Appendix B).
- A recommendation from the 3-State Study Network Assessment was the inclusion of a new ozone monitor in or near the Paradox Basin. A location has been found and the site has been installed as of March 2016. It is currently monitoring for Ozone and Meteorology at 7250 County Road 5, Paradox CO. (08-085-0005 lat. / long: 38.342743, -108.944950) (see Appendix D).

IV. Nitrogen Dioxide/Reactive Oxides of Nitrogen (NO₂/NO_y)

Historically, the APCD has monitored NO₂ at eight locations in Colorado, two of which are still in operation. Currently, there are five NO₂/NO_y monitoring locations in operation, three of which are relatively new sites. The Denver CAMP monitor exceeded the NO₂ standard in 1977 and the Welby monitor has never exceeded the average annual standard of 53 ppb.

Concentrations have shown a gradual decline over the past 20 years and during the last decade the trend has been nearly flat, averaging between 20 and 30 ppb.

In January 2010, the EPA set a new primary 1-hour NO₂ NAAQS that is in addition to the annual standard. The new standard, both primary and secondary, of 100 ppb is based on the three-year average of the 98th percentile of the yearly distribution of daily maximum one-hour concentrations.

The APCD began monitoring for NO_y at the La Casa NCore site in January 2013. NCore sites are part of a national EPA network that monitors multiple pollutants at certain “core” sites around the country. NO_y monitoring is a requirement for an NCore station, but there are no standards for NO_y. The EPA has established requirements for an NO₂ monitoring network that will include monitors at locations where maximum NO₂ concentrations are expected to occur, including within 50 meters of major roadways, as well as monitors sited to measure the area-wide NO₂ concentrations that occur more broadly across communities. Per the requirements, at least one monitor must be located near a major road in any urban area with a population greater than or equal to 500,000 people. A second monitor is required near another major road in areas with either: (1) population greater than or equal to 2.5 million people, or (2) one or more road segments with an annual average daily traffic count greater than or equal to 250,000 vehicles. In addition to the near roadway monitoring, there must be one monitoring station in each CBSA with a population of 1 million or more persons to monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales. A second near roadway site was installed and began NO₂ sampling on Oct. 1st 2015 at 4905 Acoma St. to satisfy the requirement for a second near-roadway site. The CAMP site satisfies the requirement for the neighborhood highest representative concentration site.

Denver Metro/Northern Front Range Counties

In 2014, the annual NO₂ concentration at the Welby site was 17.51 ppb. For 2013 through 2015 the one-hour standard design value for Welby is 62 ppb, which is well below the 100 ppb NAAQS. The 2015 design value for the CAMP site is 72 ppb, which again, is well below the 100 ppb NAAQS. The 2015 annual average at CAMP was 21.98 ppb. The 2015 annual average at the I-25 Denver site was 26.97 ppb. A new monitoring site that monitors for NO₂ was installed on October 1st, 2015 called I-25 Globeville, this site showed an annual average (based on only Oct. – Dec. 2015 data) of 34.32 ppb. A 3-year design value cannot be calculated for the I-25 sites as there is insufficient data to do so. The 2015 annual average at the La Casa site was 20.39 ppb. It is impossible to calculate the one-hour standard design value for La Casa as there is insufficient data to do so.

The NO₂/NO_y monitors in this area are:

08 001 3001 Welby, 3174 E. 78th Avenue
08 031 0002 CAMP, 2105 Broadway
08 031 0026 La Casa, 4545 Navajo Street
08 031 0027 I-25 Denver, 917 Yuma Street
08 031 0028 I-25 Globeville, 4905 Acoma Street

The CAMP monitor serves as an area-wide monitor. The I-25 Denver site (08-031-0027) and the I-25 Globeville (08-031-0028) sites house the required near-roadway monitors. APCD’s most recent near-roadway station installed is I-25 Globeville, it is currently set up to monitor for

NO/NO₂/NO_x, meteorological parameters, and continuous PM_{2.5} and PM₁₀ with a GRIMM and began monitoring on Oct. 1st, 2015. This site will have the capacity to expand monitoring capabilities if needed in the future. The I-25 Globeville near-roadway monitor is located at 4905 N. Acoma Street in Denver, on the City and County of Denver right-of-way island between Acoma St. and I-25. The Welby monitor is an EPA Regional Administration Required Monitor, and the monitor at the La Casa site serves as the NCore monitor.

Planned Changes in NO₂/NO_y Monitoring

EPA's current regulatory requirements include the establishment of an NO₂ near-road site in CBSA's of populations between 500 thousand and 1 million by January of 2017. The Colorado Springs CBSA falls into this population range as of the Census Bureau's 2015 estimates. Based on the latest information and guidance provided by the EPA, this requirement is being proposed for removal by EPA. Current near road monitoring shows that air quality levels, in urban areas with larger populations, are well below the National Ambient Air Quality Standards for NO₂ issued in 2010. Based on these data, EPA does not anticipate near road NO₂ concentrations to be above the health-based national air quality standards in smaller urban areas. This action would not change the requirements for near road NO₂ monitors in more populated areas, area wide NO₂ monitoring, or monitoring of NO₂ in areas with susceptible and vulnerable populations. The fact sheet and pre-publication version of the notice is at:

<https://www3.epa.gov/airquality/nitrogenoxides/actions.html> (Proposed Revisions to Ambient Nitrogen Dioxide Monitoring Requirements). Accordingly, and with the concurrence of EPA Region 8, APCD has placed a hold on the planning activities for this site. There are no other planned changes to APCD's NO₂ monitoring network at this time.

V. Sulfur Dioxide (SO₂)

The Air Pollution Control Division has monitored SO₂ at eight locations in Colorado in the past. Currently, there are four monitoring locations in operation state wide. A new one-hour primary standard was finalized in June 2010. To attain that standard, the three-year average of the 99th 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 more than once per year. In the past, SO₂ had never approached the level of any of the standards until an SO₂ analyzer was added at Highway 24 in Colorado Springs on 1/10/2013; this site exceeded the level of the standard in 2013 on 3/22/13 and 4/16/13 (1hr = 99 ppb and 1hr = 81 ppb respectively), again on 7/3/2014 (1hr = 82 ppb), and once again on 3/29/2015 (1hr = 87ppb). Each exceedance of the standard was a single occurrence of a concentration above the specified NAAQS concentration and did not take into account the three-year averaging period necessary to determine a violation of the standard. Due to the occasional values above the 75 ppb level, the area near the Highway 24 site is being studied in an effort to determine potential sources of SO₂. The Colorado Springs Department of Utilities is monitoring meteorology at its Martin Drake Power Plant in order to better characterize local conditions. APCD is also monitoring meteorology at the Highway 24 site in order to do the same. The three year design value (2013-2015) for the Highway 24 site in Colorado Springs is 56 ppb, below the 75 ppb standard.

SO₂ monitoring requirements include the need for calculating a Population Weighted Emissions Index (PWEI). This figure is calculated for each MSA by multiplying the population of the MSA by the SO₂ emissions for that MSA and dividing by 1 million. This PWEI value is

then used to determine areas in need of SO₂ monitoring. A sum of the most recent emissions data by county (2008) give a total for SO₂ emissions of 15,235 tons per year for the Denver PMSA. The calculated PWEI for this region is 37,930 million persons-tons per year. This indicates the need for one SO₂ monitor in the Denver-Aurora-Lakewood MSA according to the EPAs monitoring rules for SO₂.

Using the same calculation for the Colorado Springs MSA, the calculated PWEI is 8,207 million persons-tons per year. Because of the increase in population in Colorado Springs, there is a need for one SO₂ monitor in this MSA. The monitors listed in the sections below meet these requirements.

Data Requirements Rule

On August 21, 2015, EPA published the “Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO₂) Primary National Ambient Air Quality Standard (NAAQS)” (40 CFR Part 51). As part of the Data Requirements Rule (DRR) under 40 CFR Part 51.1203, “For each source area subject to requirements for air quality characterization, the air agency shall notify the EPA by July 1, 2016, whether it has chosen to characterize peak 1- hour SO₂ concentrations in such area through ambient air quality monitoring....The air agency shall include relevant information about monitors used to meet the requirements of this paragraph (c) in the air agency’s Annual Monitoring Network Plan required by 40 CFR 58.10 due July 1, 2016.”

One source will be characterized based on monitoring data under the DRR. Three metropolitan Denver monitors, Welby, La Casa, and CAMP, have been selected to characterize ambient SO₂ concentrations around the Public Service Company of Colorado’s Cherokee Power Station (Cherokee) for purposes of complying with the DRR. As outlined in the Technical Support Document (TSD) submitted to EPA on June 13th, 2016 titled “Analysis of Proposed Existing 1-hour SO₂ Air Monitor Network for Characterizing Ambient Air Quality Surrounding the Cherokee Power Station”, these three monitors are appropriately located to detect maximum SO₂ concentrations for the area surrounding Cherokee. The TSD may be referenced for additional support regarding selection of these monitors to fulfill DRR requirements for Cherokee Power Station.

Metropolitan Denver Counties

The concentration values are listed in ppb in accordance with the EPA’s data reporting rules for this pollutant. The monitor located at the Welby site is an EPA Regional Administrator Required Monitor.

Table 10. Maximum SO₂ Concentrations for the Denver Metro Region

Site ID	Site Name	2015 99 th %-ile 1-Hour Daily Maximum Concentration (ppb)	2013 – 2015 Design Value (ppb) ⁴
08 001 3001	Welby	16.0	21
08 031 0002	CAMP	14.0	22
08 031 0026	La Casa	15.5	22*

*The LaCasa site does not have complete data for 2013.

⁴The one-hour SO₂ design value is calculated by taking the three year average of the 99th percentile of the daily maximum one-hour averages.

Pikes Peak Region

In January of 2013 an SO₂ monitor was added to the Highway 24 monitoring station in Colorado Springs. The 99th percentile value of the one-hour daily maximum concentration for 2015 was 53 ppb. The three year average design value (2013-2015) for the site is 56 ppb.

The SO₂ monitor in this area is:

08 041 0015, Highway 24, 690 W. Highway 24

Planned Changes in SO₂ Monitoring

No changes are planned for the SO₂ monitoring network in the near future. However, there are plans for reconstruction of the Cimarron exit in Colorado Springs, which may require relocation of the Highway 24 site sometime in the future.

VI. PM₁₀

Sources of suspended particulate matter in the ambient air include mobile and stationary sources (i.e. diesel trucks, wood burning stoves, power plants, etc). Several industrial and manufacturing processes also contribute to elevated particulate levels. Suspended particulates in the atmosphere vary widely in their chemical and physical composition. Particulate matter can be directly emitted or can be formed in the atmosphere when gaseous pollutants react to form fine particles. There are also a variety of agricultural sources of PM₁₀ including feed lots, grazing, tilling, etc.

In 2015, the APCD operated 35 PM₁₀ monitors at 30 different locations. 24 of these sites use high volume filter based instruments, 4 sites use low volume filter based instruments, currently 6 sites have continuous monitors collocated with FRM monitors, 5 of which have continuous dichot particulate monitors, which monitor both PM_{2.5} and PM₁₀. There are three sites with collocated high volume samplers (CAMP, Crested Butte and Longmont), and two sites with collocated low volume samplers (La Casa and Grand Junction - Powell). The PM₁₀ NAAQS is a 24-hour average of 150 µg/m³ not to be exceeded more than once per year on average over a three year period.

This average is also based on the monitoring frequency and the percent of valid data collected at a site.⁵

Denver Metro/Northern Front Range Counties

Neither the monitor at the Fort Collins – CSU site nor the Greeley monitor had any PM₁₀ exceedances in 2015. The maximum concentrations recorded were 49 µg/m³ at Fort Collins – CSU, and 58 µg/m³ at Greeley. The Greeley Hospital (08-123-0008) site did not sample for all of February and half of March 2015 due to a reroofing project at the site.

The PM₁₀ monitoring sites in this area are:

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

⁵“Appendix K to Part 50 – Interpretation of the National Ambient Air Quality Standards for Particulate Matter,” 40 Federal Regulations 50 (1 July 2011), pp. 80-83.

There were no PM₁₀ 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 2015. Site ID numbers that include an asterisk (*) indicate a low volume sampler, while no asterisk indicates high volume samplers. The Commerce City particulate site (Alsup Elementary School 08-001-0006) was dismantled due to a reroofing project in June of 2015. APCD has decided to relocate the site. A Memorandum of Understanding is currently being negotiated between APCD and the Tri County Health Department which is across the street from the old Alsup site and near the location of a previous monitoring site. The site should recommence particulate monitoring sometime mid 2016 on the new building at 4201 E. 72nd Avenue, Commerce City Colorado.

Table 11. Maximum PM₁₀ Concentrations for the Denver Metro Area

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)
08 001 0006*	Commerce City*	84
08 001 3001	Welby	71
08 013 0003	Longmont-Municipal	50
08 013 0012	Boulder Chamber Bldg.	49
08 031 0002	CAMP	55
08 031 0017	Denver Visitor Center	74
08 031 0026*	La Casa	55

*The Commerce City site has only five months of data in 2015 due to a reroofing project and APCD relocating the site. See explanation above.

Eastern High Plains Region

The sources of PM₁₀ in the eastern plains are mainly agricultural with some mobile sources near cities and towns. There is a flour mill which may contribute to elevated PM₁₀ in Lamar.

There were three PM₁₀ exceedances at the Lamar Municipal site in 2015 with the highest concentration recorded at this site being 423 µg/m³. These events are under consideration as being exceptional events and it is anticipated that the EPA will concur with the determinations and recommendations of the APCD as being exceptional events and therefore not exceeding of the NAAQS.

The PM₁₀ monitoring site in this area is:

08 099 0002 Lamar Municipal, 104 E. Parmenter Street

Pikes Peak Region

There were no exceedances of the PM₁₀ NAAQS in this region for 2015. The highest concentration recorded at the Colorado College site was 47 µg/m³. This monitor is a low-volume sampler.

The PM₁₀ monitoring site in this area is:

08 041 0017 Colorado College, 130 West Cache la Poudre

San Luis Valley Region

There were no exceedances in this region in 2015. The maximum concentration at Alamosa – Adams State College was $94 \mu\text{g}/\text{m}^3$ and the maximum concentration at Alamosa Municipal was $127 \mu\text{g}/\text{m}^3$. Both monitors are high volume filter based samplers.

The PM₁₀ monitoring sites in this area are:

08 003 0001 Alamosa-Adams State College, 208 Edgemont Boulevard
08 003 0003 Alamosa-Municipal, 425 4th Street

South Central Region

There were no exceedances in this region in 2015. The maximum concentration found at the Pueblo – Fountain School was $68 \mu\text{g}/\text{m}^3$.

The PM₁₀ monitoring site in this area is:

08 101 0015 Pueblo – Fountain School, 925 North Glendale Avenue

Central Mountain Region

There were no PM₁₀ exceedances in the Central Mountain region during 2015. The table below lists the maximum concentrations recorded at each of the sites.

Table 12. Maximum PM₁₀ Concentrations for Mountain Counties

Site ID	Site Name	Max. 24-Hour Concentration ($\mu\text{g}/\text{m}^3$)
08 043 0003	Cañon City – City Hall	40
08 051 0004	Crested Butte	92
08 051 0007	Mount Crested Butte	62
08 097 0006	Aspen – Yellow Brick	59
08 107 0003	Steamboat Springs	70

Southwestern Region

There were no exceedances of the PM₁₀ standard in 2015 for this area. The maximum concentration at Pagosa Springs was $101 \mu\text{g}/\text{m}^3$, and the maximum concentration at Durango – River City Hall was $39 \mu\text{g}/\text{m}^3$.

The PM₁₀ monitoring sites in this area are:

08 007 0001 Pagosa Springs, 309 Lewis Street
08 067 0004 Durango – River City Hall, 1235 Camino Del Rio

Western Slope Region

There were no PM₁₀ exceedances in the Western Slope region in 2015. 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 a high volume sampler. Sources of PM₁₀ 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 PM₁₀ including feed lots, grazing,

tilling, and other dry land agricultural activities.

Table 13. Maximum PM₁₀ Concentrations in Western Slope Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)
08 029 0004	Delta	56
08 045 0005	Parachute	36
08 045 0007	Rifle – Henry Building	46
08 045 0018	Carbondale	69
08 077 0017*	Grand Junction – Powell	37
08 113 0004	Telluride	132

Planned Changes in PM₁₀ Monitoring

The Alsup Elementary site in Commerce City (08-001-0006) was removed from the building in late May of 2015 due to a reroofing project. APCD has decided to move the Alsup site across the street to the Tri County Health Department building at 4201 E. 72nd Avenue, Commerce City Colorado. Negotiations are currently under way for the use of the Tri County Health Department building and the site should recommence particulate sampling sometime mid 2016. A continuous Grimm PM₁₀ and PM_{2.5} monitor was installed at the new near road (I-25 Globeville 08-031-0028) monitoring shelter in Oct. of 2015. Removal of the filter based PM₁₀ Low – volume collocated sampler at LaCasa (08-031-0026) will occur in 2016. Collocation for low volume PM₁₀ monitoring requirements will be met with the APCD’s Powell site in Grand Junction. The APCD will still report PM_{10-2.5} from LaCasa on an every third day frequency based on concentrations recorded from the filter based PM₁₀ and PM_{2.5} operated at the site. A reconfiguration of the low volume PM_{2.5} sampler at Colorado College (08-041-0017) to a PM₁₀ sampler will occur in 2016. This will remove the only 126 method code (low volume PM₁₀ R&P 2000) from the APCD’s network. APCD will apply for waivers for the Alamosa – Adams State College, and Mt. Crested Butte particulate sites, as they no longer meet siting criteria due to large trees or buildings near the monitors. There are no additional planned changes to the PM₁₀ monitoring network for 2016.

VII. PM_{2.5}

Sources of fine particulate matter in the atmosphere include all types of combustion activities (motor vehicle, power plants, wood burning, etc) and certain types of industrial activities. Oil and gas development may also contribute to elevated suspended fine and coarse particulate matter.

The annual PM_{2.5} standard of 12 µg/m³ is compared to the three-year average annual mean PM_{2.5} concentration. The 24-hour PM_{2.5} standard of 35 µg/m³ is compared to the three-year average of the annual 98th percentile value.

PM_{2.5} concentration values are reported in four different groups of readings by the APCD. Data from instruments sampling according to the Federal Reference Method (FRM) are reported with an 88101 parameter code, data from continuous samplers that reasonably compare

to the FRM are reported with the 88500 parameter code, data from continuous samplers that don't compare reasonably to the FRM are reported with the 88501 parameter code, and speciation data is reported with the 88502 parameter code. Currently, there are 16 FRM instruments at 14 sites, of the 14 sites 10 are collocated with a continuous instrument and two are collocated with another FRM; three sites (National Jewish Hospital, Boulder Marine St., I-25 Globeville) have continuous PM_{2.5} but no FRM. Speciation samples are taken at 3 sites; LaCasa, Platteville and Alsup with all three being collocated with an FRM. There will be some notable changes coming to the PM_{2.5} network in mid 2016. APCD will be removing five FRM filter based instruments and replacing them with GRIMM 180 EDM continuous particulate monitoring instruments for comparison to the NAAQS. These sites include: the new Commerce City site which should be operational mid 2016 (08-001-0008), Colorado College (08-041-0017), Fort Collins (08-069-0009), Grand Junction (08-077-0017) and Greeley Hospital (08-123-0006). More details are given below in "Planned Changes in PM_{2.5} Monitoring". The GRIMM EDM 180 has proven to be an accurate, efficient, low maintenance, cost effective way to continuously monitor for PM_{2.5} and PM₁₀. APCD installed its' first GRIMM 180 EDM in late 2013 at CAMP and has since slowly been transitioning its' continuous particulate monitoring to GRIMM instruments due to their data reliability, ease of operation and cost savings in maintenance with fewer man hours and replacement parts necessary.

Denver Metro/Northern Front Range Region

The PM_{2.5} sites listed below are filter based FRM sites in the APCD network and are suitable for comparisons to the annual PM_{2.5} NAAQS as of December 31, 2011.

There were no PM_{2.5} exceedances in 2015 in the Larimer and Weld County area. The table below lists the 24-hour Design Value (98th percentile averaged over 3 years) recorded at each of the sites in Larimer and Weld Counties as well as the Annual Design Values (annual mean averaged over 3 years). The monitoring data listed below are all from FRM monitors.

Table 14. Maximum PM_{2.5} Concentrations in Northern Front Range Counties

Site ID	Site Name	24-Hour Design Value (µg/m³)	Annual Design Value (µg/m³)
08 069 0009	Fort Collins – CSU	21	6.8
08 123 0006	Greeley – Hospital	24	7.3
08 123 0008	Platteville	27	7.8

There were no exceedances of the PM_{2.5} standard in the Denver Metro area in 2015. The table below lists the 24-hour and Annual Design Values recorded in 2015 for each site in the Denver Metro area. All the monitoring data listed in the table are from FRM monitors.

Table 15. Maximum PM_{2.5} Concentrations in the Denver Metro Area

Site ID	Site Name	24-Hour Design Value (µg/m ³)	Annual Design Value (µg/m ³)
08 001 0006	Commerce City (Alsup)	25*	8.0*
08 005 0005	Arapahoe Community College	21	6.3
08 013 0003	Longmont – Municipal	24	7.0
08 013 0012	Boulder Chamber of Commerce	17	5.9
08 031 0002	CAMP	22	7.5
08 031 0026	La Casa	22	7.5
08 031 0027	I-25 Denver	28*	10.0*
08 035 0004	Chatfield Reservoir	17	5.5

* Data set does not meet completeness criteria. The Alsup Elementary site was reroofed and dismantled in May of 2015 making the data incomplete for that year. I-25 Denver began monitoring for PM_{2.5} in mid 2013 making 3 years of data incomplete.

CAMP and LaCasa are technically micro-scale sites but are EPA approved as neighborhood scale. Based on ongoing data collection and analysis, CAMP can be shown to be analogous with sites ranging from Commerce City to La Casa, and is well correlated with sites within the Platte Valley from Greeley and Platteville in the north to Chatfield in the south, and is thus approved as neighborhood scale.

- 08 031 0002-1 Denver CAMP, 2105 Broadway
- 08 031 0026-1 La Casa, 4587 Navajo 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 APCD 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.

Pikes Peak Region

There were no exceedances of the PM_{2.5} standard in 2015 in the Pikes Peak Region. The 24-Hour Design Value at the Colorado College site was 17 µg/m³, and the Annual Design Value was 5.7 µg/m³.

- The PM_{2.5} monitoring site in this area is:
- 08 041 0017 Colorado College, 130 West Cache la Poudre

South Central Region

There were no exceedances of the PM_{2.5} NAAQS standard in the South Central region in 2015. The 24-Hour Design Value at the Pueblo – Fountain School was 17 µg/m³ and the Annual Design Value was 5.8 µg/m³.

- The PM_{2.5} monitoring site in this area is:
- 08 101 0015 Pueblo – Fountain School, 925 North Glendale Avenue

Southwest Region

There were no exceedances of the PM_{2.5} standard in the Southwest region in 2015. The 24-Hour Design Value at Cortez was 10 µg/m³, and the Annual Design Value was 5.3 µg/m³ though these values are not valid for the 3 year average due to the site being removed at the end of June 2015. The site had met its' monitoring objectives and showed low concentrations for PM_{2.5}. The site is still currently monitoring for ozone.

The PM_{2.5} monitoring site in this area is:

08 083 0006 Cortez, 106 West North Street

Western Slope Region

There were no PM_{2.5} exceedances recorded in the Western Slope region in 2015. The 24-Hour Design Value at Powell was 26 µg/m³, and the Annual Design Value was 7.4 µg/m³.

The PM_{2.5} monitoring site in this area is:

08 077 0017 Grand Junction – Powell, 650 South Avenue

PM_{2.5} GRIMM, TEOM and BAM Continuous Monitors

All Federal Reference Method (FRM) monitors in the Colorado PM_{2.5} network are currently compared to the NAAQS. The FRM monitors are all filter based 24-hour composite samples. The GRIMM EDM EDM 180 has received Federal Equivalent Method (FEM) designation for PM_{2.5} from the EPA in 2011 and is the only real-time continuous data that the APCD uses to compare to the NAAQS. The APCD has recently made the decision to replace all of its aging TEOM fleet with GRIMM EDM 180 continuous particulate monitoring technology. This change will happen over time as resources become available. APCD replaced the first TEOM at CAMP in April of 2013 with a GRIMM EDM 180 and has since added many more. APCD has determined the GRIMM EDM 180 to be a more reliable cost effective way to monitor ambient continuous particulate concentrations than TEOM instruments.

The APCD currently employs a variety of FEM continuous particulate monitors for forecasting and advising the public of air quality alerts. The TEOM 1400ab with 8500 FDMS and the BAM-1020 are federally equivalent monitors; however frequent monitor problems and APCD concerns regarding equivalency designation have forced the APCD to consider these instruments not suitable for regulatory purposes. The following sites have continuous PM_{2.5} monitors that are currently not intended for comparison with the NAAQS, these sites will eventually all be switched to GRIMM EDM 180 instruments (with the exception of Rifle) and at that time will be used for NAAQS comparisons at some sites (see Appendix C):

08 001 0006-3 Commerce City, 7101 Birch Street (currently in process of being relocated)

08 013 0003-3 Longmont-Municipal, 350 Kimbark Street

08 013 1001-3 Boulder CU/Athens, 2102 Athens St. (will be moved to Boulder Reservoir)

08 031 0013-3 NJH-E, 14th Avenue and Albion 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 3rd Street (not reported to AQS)

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_{2.5} 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_{2.5} 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_{2.5} NAAQS.” The CMZ is an optional technique that averages the PM_{2.5} 24-hour concentrations from two or more monitors located in the same community.

If the PM_{2.5} 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 days prior to the APCD selecting a new site.

Planned Changes in PM_{2.5} Monitoring

Notable changes occurring within APCD’s PM_{2.5} network include the removal and replacement of five of the primary Federal Reference Method (FRM) filter based monitors with GRIMM 180 EDM continuous instruments for comparison to the NAAQS standards. These changes should occur during the 2016 calendar year with an expected completion in mid 2016. APCD is making these changes because the GRIMM has proven to be a reliable, low cost, low maintenance way to accurately monitor for PM_{2.5} and PM₁₀. APCD has collocated GRIMM instruments with FRM instruments at a number of sites for extended periods of time and the data sets compare well. This will make APCD’s PM_{2.5} monitoring more efficient by saving man hours retrieving samples, maintaining aging FRM instruments and will save money over time on laboratory analysis costs. APCD eventually will also be replacing all of the TEOM instruments within its network with GRIMM instruments. The GRIMM instruments function much more reliably than the TEOM instruments. The changes occurring will be as follows:

- Adams County (Alsup Elementary site 08-001-0006) is currently in the process of being moved from the Alsup Elementary school building to the Tri County Health Department building across the street at 4201 E. 72nd Avenue in Commerce City. This site will have a GRIMM as the primary and will be collocated with a filter based PM_{2.5} FRM. It will also recommence PM_{2.5} speciation sampling and will have a filter based low volume PM₁₀ sampler running at the site.
- I-25 Denver (08-031-0027) will have the filter based PM_{2.5} FRM removed and have the GRIMM used as the primary.
- I-25 Globeville (08-031-0028) has a GRIMM used as the primary.

- Colorado College (08-041-0017) will have the filter based PM_{2.5} FRM and TEOM removed and a GRIMM will be installed and used as the primary.
- Ft. Collins (08-069-0009) will have the filter based PM_{2.5} FRM removed and will use the GRIMM as the primary.
- Grand Junction Powell (08-077-0017) will have the filter based PM_{2.5} FRM removed and will use the GRIMM as the primary.
- Greeley will have the filter based PM_{2.5} FRM and TEOM removed and will use a GRIMM as the primary.

The Alsup Elementary School site (08-031-0006) was dismantled in late May of 2015 due to a reroofing project on the building. APCD has decided to relocate the site across the street to the Tri County Health Department building. Negotiations are currently under way and sampling should recommence at the Tri County Health Department building sometime mid 2016. A continuous Grimm PM₁₀ and PM_{2.5} monitor was installed at the new near road monitoring shelter in Oct. of 2015. The Cortez PM_{2.5} monitoring sampler was removed at the end of June, 2015 due to low concentrations found and the end of monitoring requirements achieved. The Boulder Marine Street continuous particulate TEOM site (08-013-1001) will be relocated to the new Boulder Reservoir site and replaced with a GRIMM. There are no other planned changes in PM_{2.5} monitoring at this time.

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 DMAS NCore. In 2012 when DMAS was moved to La Casa, TSP sampling for lead was discontinued at the APCD's NCore site and PM₁₀ sampling for lead began. Because this is an NCore site, no waiver is required for using PM₁₀ sampling in lieu of TSP sampling for lead concentrations. In the past three years the maximum quarterly lead concentration has generally been less than a tenth of the current standard. In addition, Colorado has not recorded an exceedance of the previous lead standard (1.5 µg/m³ averaged over a calendar quarter) since the first quarter of 1980. The new lead standard, which is 0.15 µg/m³ averaged over any three rolling consecutive three-month periods, has not been exceeded using data from 2013 - 2015. 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 APCD located a lead sampling site at the Centennial Airport. This monitoring site was installed in March 2011 and the first sample was collected on April 3, 2011. 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 was likely due to the economic recession. The Centennial Airport TSP sampler was decommissioned on Dec. 31st, 2014 due to the site meeting its sampling requirements and it regularly showing concentrations well below the standard.

Denver Metro/Front Range Region

There are various 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 2015. The maximum lead value ever recorded by the Centennial monitor during its 4.5 years in operation was 0.12 $\mu\text{g}/\text{m}^3$. The maximum lead value for 2015 at La Casa was 0.004 $\mu\text{g}/\text{m}^3$.

The only PM₁₀/Lead monitoring site managed by APCD in all of Colorado in 2015 is at:
08 031 0026 La Casa, 4587 Navajo Street

Planned Changes in TSP and Lead Monitoring

The EPA has recently proposed the elimination of the requirement to measure lead at NCore sites from Appendix D of 40 CFR Part 58.19 due to the extremely low concentrations being recorded at these sites. Since the requirement to monitor non-point source lead at NCore sites with populations over 500,000 was finalized in 2010, over 50 urban NCore sites have measured lead values ten times below the NAAQS standard of 0.15 micrograms per cubic meter on average. After the removal of this requirement by EPA and the low concentrations recorded at LaCasa (NCore 08-031-0026), the APCD has decided to eliminate this lead monitor from the network (see appendix C). This change should be finalized and take place sometime mid 2016. Ambient lead concentrations will still be measured at the PM_{2.5} speciation and IMPROVE sites throughout the state, as well as on the PM₁₀ sampler at Grand Junction-Powell (08 077 0017) as part of the National Air Toxics Trends Stations project.

IX. METEOROLOGICAL MEASUREMENTS

Meteorological measurements taken by the APCD consist of Wind Speed, Wind Direction, Temperature, and some sites are equipped with Relative 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 3001 Welby, 3174 E. 78th 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 0026 La Casa, 4587 Navajo Street
08 031 0027 I-25 Denver, 913 Yuma Street
08 031 0028 I-25 Globeville, 4905 Acoma Street
08 035 0004 Chatfield State Park, 11500 N. Roxborough Park Road
08 041 0015 Highway 24, 690 W. Hwy. 24
08 045 0012 Rifle Health Dept., 195 W. 14th Street

08 059 0002 Arvada, 9101 W. 57th Avenue
08 059 0005 Welch, 12400 W. Hwy 285
08 059 0006 Rocky Flats-N, 16600 W. Hwy 128
08 059 0013 Aspen Park, 26137 Conifer 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
08 081 0003 Elk Springs, 33902 US Hwy. 40 (Began August of 2015)
08 099 0003 Lamar Port of Entry, 7100 US Hwy 50
08 123 0009 Greeley – Weld County Tower, 3101 35th Avenue
00 085 0005 Paradox, 7250 County Road 5 (Began March of 2016)

Planned Changes in Meteorological Monitoring

The Alsup site (08-001-0006) has been decommissioned in May of 2015 due to a reroofing project on the building and APCD will no longer be monitoring for meteorological parameters at that site. APCD will be installing meteorological monitoring at the new Boulder Reservoir site. The Highland Reservoir site (08-005-0002) was closed from Oct. 1st 2013 to Sept. 1st 2015. The Highlands site began monitoring again for ozone and meteorological parameters Sept. 1st, 2015 after being shut down for over one year for underground water soratge tank renovations on the site. A new meteorological tower has been installed at the new Near-Road site, I-25 Globeville at 4905 Acoma Street (08-031-0028) on Oct. 1st, 2015. The new Elk Springs site (08-081-0003) was also equipped with meteorological monitoring on Aug 1st, 2015. The new Paradox Basin site (08-085-0005) has been equipped with meteorological parameters including precipitation measurements and began sampling in March of 2016. The Paradox site is located at 7250 County Road 5 near Paradox Colorado.

X. QUALITY ASSURANCE

Continuous Monitors

The Technical Services Program (TSP) staff performs three types of gaseous analyzer performance checks: quality control 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 (QA) staff conducts independent accuracy audits on all of the instruments at least twice per year. The APCD Gaseous and Meteorology Monitoring (GMM) staff conducts quality control 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 these procedures is available in the APCD Quality Assurance Project Plan (QAPP) and the results are available from the APCD or through the national EPA AQS database.

Particulate Monitors

The audit checks performed on the particulate monitors consist of calibrated flow rate checks, as well as temperature and pressure sensor checks. The precision checks that are made on filter based particulate monitors consist of collocated samplers that operate side-by-side and collect a sample from both samplers once every sixth day. The precision checks for continuous

particulate monitors consist of monthly flow rate verification checks. EPA requires a minimum of 15% of the FRM network to be collocated. In 2015 Colorado maintained 14 filter based FRM monitoring sites, four of which had collocated instruments (CAMP, Commerce City, La Casa, and Grand Junction). 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 APCD's PM_{2.5} sampler (between 1 – 4 m apart). All of the samples are then compared to ensure that the data are within federal limits and meet pre-established data quality objectives.

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.

Meteorological Monitors

Annual calibrations and audit checks are performed on the meteorological equipment to determine proper alignment and operation of the sensors. 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 or in the APCD QAPP.

XI. SUMMARY OF NETWORK CHANGES

Over the past year, several network changes occurred, and during the next year several more changes are planned. This section summarizes the completed and planned changes below.

Completed Changes

The following changes to the CDPHE monitoring network occurred during 2015/2016.

- Lay Peak Ozone and Meteorological Monitoring was closed as of December 31, 2014 and moved to Elk Springs, commencing Aug. 1, 2015.
- The Aspen Library particulate site was relocated from the Library to the Yellow Brick Building and a GRIMM EDM 180 was added to the site in February, 2015.
- The La Casa TEOM's (PM₁₀ and PM_{2.5}) samplers were replaced with a GRIMM EDM 180 continuous particulate monitor in February, 2015.
- A BAM continuous particulate monitor replaced the Thermo 1405df at the Rifle particulate monitoring site in March 2015.
- A GRIMM EDM 180 continuous particulate monitor replaced the Thermo 1405df at the Fort Collins Edison site on June 25, 2015.
- A new near road monitoring site was completed and installed at the I-25 Globeville site on Oct. 1, 2015. This site is monitoring for NO_x parameters, continuous particulate and meteorological parameters.
- The Cortez PM_{2.5} sampling monitor was decommissioned and shut down July 1, 2015. The town of Cortez is now only monitoring for Ozone.
- The Highlands Reservoir site began sampling again for meteorological parameters and ozone on Sept. 1, 2015 after being closed down due to construction activities on the property.

- The Greeley West Annex carbon monoxide monitor was shut down and relocated to the Greeley County Tower monitoring site on April 7, 2015.
- The Clifton PM₁₀ monitoring site was dismantled and removed in early 2015 due to the site meeting its' monitoring objectives.
- An additional recommendation from the 3-State Study Network Assessment was the inclusion of a new ozone monitor in or near the Paradox Basin. The site has been secured and established. Monitoring for ozone and meteorological parameters began at the Paradox Basin site (08-085-0005) at 7250 County Road 5, in March of 2016 (see Appendix D).

Planned Changes

The following changes to CDPHE's monitoring network are planned for 2016.

- The removal and replacement of six of the primary PM_{2.5} filter based FRM instruments with continuous GRIMM particulate monitors for comparison to the NAAQS with an expected completion mid 2016. These sites include: the new Adams County site (08-001-0008) with the use of a filter based FRM as collocation with the GRIMM, I-25 Denver (08-031-0027), Colorado College (08-041-0017), Ft. Collins (08-069-0009), Grand Junction Powell (08-077-0017) and Greeley Hospital (08-123-0006).
- At La Casa (08-031-0026) the collocated low volume PM₁₀ will be removed and APCD will also discontinue the primary and collocated lead analysis. Lead monitoring will continue in Colorado only at its' SASS, CSN and IMROVE sites and also at the Grand Junction Powell site (08-077-0017) as part of the National Air Toxics Trends Stations program. Low volume PM₁₀ collocation requirements will be met with ongoing low volume PM₁₀ collocation at APCD's Grand Junction Powell site (08-077-0017).
- A new location for South Boulder Creek ozone monitoring station has been selected because the site no longer meets siting criteria due to the presence of large trees near and around the station that cannot be removed. The South Boulder Creek site stopped monitoring Dec. 31st, 2015. A new location at the Boulder Reservoir has been established and it should be monitoring for ozone, continuous particulate and meteorological parameters sometime mid 2016.
- Alsup Elementary site in Commerce City Colorado (Adams County) was dismantled in May of 2015 due to a reroofing project on the building. APCD has decided to relocate the site across the street to the Tri County Health Department building. Negotiations are currently under way for the use of the new building and particulate sampling should recommence sometime mid 2016. The meteorological parameters that were monitored at the old Alsup site will not be resumed at the new site.
- The Boulder CU/Athens TEOM site (08-013-1001) will be removed and relocated to the new Boulder Reservoir ozone site in mid 2016. The TEOM will be decommissioned and replaced with a GRIMM EDM 180 at the new site.
- The APCD plans to discontinue the use of all TEOM's within its network and replace them with GRIMM EDM 180 instruments. The GRIMM instrumentation has been determined by APCD to be a more reliable cost effective way to measure continuous particulate. This change should occur at most sites by mid 2016 and be completed at all sites when the resources become available.

XII. APPENDIX A, C, D, E REQUIREMENTS SUMMARY

This section summarizes the requirements of 40 CFR 58, Appendices A, C, D, and E, as they pertain to the CDPHE's ambient air monitoring network, as well as how these specific requirements are being met.

Appendix A of 40 CFR 58 covers the data quality assurance requirements for SLAMS, SPMs, and PSD monitors. The requirements state the need for, and frequency of zero, span, and precision processes on the analyzer. It also specifies the auditing requirements for each monitor type. Audits of each particulate analyzer are performed on a quarterly basis and most gaseous analyzers on a twice a year basis. These results are tracked in a database at the CDPHE, and are available upon request. A zero/span, or a zero/precision routine is run on each of the gaseous monitoring instruments in the CDPHE's network on a nightly basis. These results are kept "in-house" at the CDPHE, and are available on request. Manual quality control checks are performed on all gaseous instruments on a two week basis and the results of these quality control tests are uploaded to the AQS database.

Appendix C of 40 CFR 58 specifies the criteria pollutant monitoring methods (manual analyzers or automated analyzers) which must be used in SLAMS and NCore stations that are a subset of SLAMS. The monitor types and sampling frequencies are listed in Table 1, as well as in the station summaries found in Appendix A of this document.

Appendix D of 40 CFR 58 specifies the network design criteria for ambient air quality monitoring. It covers the monitoring objectives and spatial scales, the general monitoring requirements, the design criteria for NCore sites, pollutant specific design criteria for SLAMS sites, and the design criteria for Photochemical Assessment Monitoring Stations (PAMS). These requirements are addressed in the individual pollutant sections.

Appendix E of 40 CFR 58 contains the specific location criteria applicable to SLAMS, NCore, and PAMS ambient air quality monitoring probes, inlets, and optical paths after the general location has been selected based on the monitoring objectives and spatial scale of representation discussed in Appendix D of 40 CFR 58. Adherence to these specific siting criteria is necessary to ensure the uniform collection of compatible and comparable air quality data. To ensure that all sites in the network meet the appropriate criteria, the CDPHE performs thorough site evaluations annually. These evaluations include measurements of the probe heights and locations, as well as residence time determinations for each gaseous analytical instrument. The results of these site evaluations are available upon request.

Appendix A - Monitoring Site Descriptions

Appendix A 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 16. Monitoring Site Locations and Instruments

<i>AQS #</i>	<i>Site Name</i>	<i>CO</i>	<i>O₃</i>	<i>NO</i>	<i>NO₂/NO_y</i>	<i>SO₂</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>	<i>Met</i>	<i>App. A,C,D,E Reqs. Met?</i>
08 001 0006	Alsup Elementary School - Commerce City						X	X	X	YES (moving to Tri County Health Bldg.)
08 001 3001	Welby	X	X	X	X	X	X		X	NO - trees
08 003 0001	Alamosa – Adams State Coll.						X			NO - trees
08 003 0003	Alamosa – Municipal Bldg.						X			YES
08 005 0002	Highland Reservoir		X						X	YES
08 005 0005	Arapahoe Comm. Coll.							X		YES
08 005 0006	Aurora – East		X						X	YES
08 007 0001	Pagosa Springs School						X			YES
08 013 0003	Longmont-Municipal Bldg.						X	X		YES
08 013 0012	Boulder Chamber of Commerce						X	X		NO - trees
08 013 1001	Boulder – CU - Athens							X		YES (will be moved to Boulder Res.)
08 029 0004	Delta Health Dept						X			YES
08 031 0002	Denver – CAMP	X	X	X	X	X	X	X	X	NO – trees
08 031 0013	Denver - NJH-E							X		NO - trees
08 031 0016	DESCI									YES
08 031 0017	Denver Visitor Center						X			NO - trees
08 031 0026	La Casa	X	X	X	X	X	X	X	X	YES
08 031 0027	I-25 Denver	X		X	X		X	X	X	YES
08 031 0028	I-25 Globeville			X	X		X	X	X	YES
08 035 0004	Chatfield State Park		X					X	X	YES
08 041 0013	U. S. Air Force Academy		X							YES
08 041 0015	Colorado Springs Hwy 24	X				X			X	YES
08 041 0016	Manitou Springs		X							YES
08 041 0017	Colorado College						X	X		YES
08 043 0003	Cañon City – City Hall						X			YES
08 045 0005	Parachute – Elem. School						X		X	YES
08 045 0007	Rifle – Henry Bldg						X	X	X	YES
08 045 0012	Rifle – Health Dept		X							YES
08 045 0018	Carbondale						X			YES
08 051 0004	Crested Butte						X			YES
08 051 0007	Mt. Crested Butte - Realty						X			NO - Building
08 059 0002	Arvada								X	YES

<i>AQS #</i>	<i>Site Name</i>	<i>CO</i>	<i>O₃</i>	<i>NO</i>	<i>NO₂/NO_y</i>	<i>SO₂</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>	<i>Met</i>	<i>App. A,C,D,E Reqs. Met?</i>
08 059 0005	Welch		X						X	YES
08 059 0006	Rocky Flats - N		X						X	YES
08 059 0011	NREL		X							YES
08 059 0013	Aspen Park		X						X	NO - trees
08 067 0004	Durango-River City Hall						X			YES
08 069 0009	Fort Collins – CSU - Edison						X	X		NO - trees
08 069 0011	Fort Collins - West		X							YES
08 069 1004	Fort Collins - Mason	X	X						X	YES
08 077 0017	Grand Junction – Powell Bldg						X	X		YES
08 077 0018	Grand Junction - Pitkin	X							X	YES
08 077 0020	Palisade Water Treatment		X						X	YES
08 083 0006	Cortez – Health Dept		X					X		YES
08 085 0005	Paradox		X						X	YES
08 097 0006	Aspen – Yellow Brick						X	X		YES
08 099 0002	Lamar Municipal						X			YES
08 099 0003	Lamar Port of Entry								X	YES
08 101 0015	Pueblo - Fountain School						X	X		YES
08 107 0003	Steamboat Springs						X			YES
08 113 0004	Telluride						X			YES
08 123 0006	Greeley-Hospital						X	X		YES
08 123 0008	Platteville Middle School							X		YES
08 123 0009	Greeley – County Tower	X	X						X	YES

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.

PM₁₀ and PM_{2.5} monitoring began in January 2001 and continues today. There are a collocated set of PM_{2.5} FRM monitors, along with a continuous PM_{2.5} monitor, a trends speciation monitor, and a PM_{2.5} carbon monitor all in operation.

Meteorological monitoring began in June of 2003 at Alsup. An upgrade to the meteorological monitoring equipment took place in 2014, adding relative humidity measurements.

The Alsup Elementary site was dismantled in May of 2015 due to a reroofing project on the building. APCD has decided to relocate the Alsup site across the street to the Tri County Health Department building (08-001-0008). Negotiations are currently under way for the use of the new building and sampling should recommence in mid 2016 (meteorological monitoring will be discontinued at the new site).

Welby, 3174 E. 78th 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).

O₃ monitoring began at Welby in July of 1973. The Welby monitor has not recorded an exceedance of the old one-hour O₃ standard since 1998. However, the trend in the 3-year average of the 4th maximum eight-hour average has been increasing since 2002.

The Welby NO₂ 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 due to growth in trees that are not allowed to be removed.

The Welby SO₂ monitor began operation in July of 1973.

PM₁₀ monitoring began at Welby in June and July of 1990. The continuous particulate monitor began operation in June, while the high volume particulate monitor began operation in July.

Meteorological monitoring began in January of 1975.

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

The 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 PM₁₀ levels.

Meteorological data are not available from the area. The city has a population of 8,780 (2010 Census data). This is an increase of 10.3% 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 PM₁₀ monitor in June 1990. This is a population oriented neighborhood scale SLAMS monitor that is on a daily sampling schedule.

Alamosa - Municipal, 425 4th Street (08 003 0003):

The Alamosa 425 4th 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.

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 high urban O₃ concentrations although it may not be in the area of maximum concentrations. This is a population oriented neighborhood scale SLAMS monitor.

Meteorological monitoring began in July of 1978.

In September of 2010 the site and meteorological tower were relocated to the east by approximately 30 meters to allow for the construction of an emergency generator system. This emergency generator system is located approximately 20 meters northwest of the new site location. The Highlands monitoring site had to be shut down from approximately Oct. of 2013 to Sept. of 2015 due to major construction activities on the property. The site is currently back up and monitoring for ozone and meteorological parameters.

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_{2.5} 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 360⁰ exposure. Based on the topography and meteorology of the area ACC is in an area where PM_{2.5} 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, 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.

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 aid in the determination of the eastern most extent of the high urban O₃ concentrations. 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. This was a special purpose monitor (SPM) for a regional scale, and became a SLAMS monitor in 2013.

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 PM₁₀ 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 PM₁₀ nonattainment area and a SIP was implemented for this area. PM₁₀ concentrations were exceeded a few times in the late 1990s.

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 regional 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 PM₁₀ followed by PM_{2.5} monitors in 1999.

Longmont's predominant wind direction is from the north through the west due to winds draining from the St. Vrain Creek Canyon. The PM₁₀ 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. In September of 2014 APCD installed a collocated sampler at the site to meet EPA PM₁₀ high volume collocation requirements.

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 O₃ monitor as a part of the "summer 1993 Denver O₃ 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 O₃ monitoring site when the instruments were moved into a new shelter.

This is a highest concentration oriented urban scale SLAMS monitor.

The South Boulder Creek monitoring station has been shut down as of January 1st, 2016 due to the site no longer meeting siting criteria. Large trees have grown over the years near the shelter that cannot be removed. A new location at the Boulder Reservoir has been secured and should be monitoring sometime mid 2016.

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_{2.5} 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.

PM₁₀ monitoring began at this site in December of 1994, while the PM_{2.5} monitoring did not begin until January of 1999.

The predominant wind direction at the APCD'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 houses a continuous TEOM particulate monitor inside the shelter. The site began operation in November 2004. A dome is erected each fall over the practice field and remains inflated until early spring when it is removed for the summer months. This site will be shut down in 2016 and moved to the new Boulder Reservoir Site. The TEOM will be replaced by a GRIMM EDM 180 at the new site.

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 Uncompaghre River Valley surrounded by high mesas and mountains. 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 PM₁₀ due to agricultural burning, automobile traffic, and the former Louisiana Pacific wafer board plant. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

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.

Sampling for all parameters at the site was discontinued from June of 1999 to July of 2000 for the construction of a new building.

The NO₂ monitor began operation in January 1973 at this location.

The SO₂ monitor began operation in January 1967.

O₃ monitoring began originally in 1972 and has been intermittently monitored through January 2008. The current O₃ monitor began operation in February 2012.

The PM₁₀ monitoring began in 1986 with the installation of collocated monitors, and was furthered by the addition of a continuous monitor in 1988.

The PM_{2.5} monitoring began in 1999 with a sequential filter based FRM monitor. A continuous TEOM FEM PM_{2.5} monitor was installed in February of 2001 and an FDMS was installed on the instrument November 1, 2003. In April 2013, the TEOM/FDMS was replaced with a GRIMM EDM 180 continuous monitor, which concurrently measures both PM₁₀ and PM_{2.5}.

Meteorological monitoring began at this site in January of 1965.

NJH-E, 14th Avenue & Albion Street (08 031 0013):

This site is located three miles east of the Denver CBD, close to a very busy intersection (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 site in the corner of the laboratory building at the corner of Colorado Boulevard and Colfax Avenue. Data from this continuous TEOM particulate 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.

DESCI:

A visibility site was installed in Denver in late 1990 using a long-path transmissometer. Visibility in the downtown area is monitored using a receiver located near Cheesman Park at 1901 E. 13th Avenue, and a transmitter located on the roof of the Federal Building at 1929 Stout Street. Renovations at the Federal Building forced the transmissometer to temporarily move to 1255 19th Street in 2010, and quality control measurements showed no meaningful difference between old and new locations. This instrument directly measures light extinction, which is proportional to the ability of atmospheric particles and gases to attenuate image-forming light as it travels from an object to an observer. The station also monitors relative humidity in order to resolve low visibility because of fog or rain.

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 PM₁₀ standard in the Denver metropolitan area since 1987. The Visitor Center recorded a PM₁₀ level of 161 µg/m³ on January 14, 1993. Since then, high values have been observed but have been below the NAAQS of 150 µg/m³. 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.

La Casa, 4587 Navajo Street (08 031 0026):

The La Casa site was established in January of 2013 as a replacement for the Denver Municipal Animal Shelter (DMAS) site when a land use change forced the relocation of the site. The La Casa location has been established as the NCore site for the Denver Metropolitan area. In late 2012 the DMAS site was decommissioned and moved to La Casa in northwest Denver and includes a trace gas/precursor-level CO analyzer, and a NO_y analyzer, in addition to the trace level SO₂, O₃, meteorology, and particulate monitors. La Casa has been certified in 2013 as an NCore compliant site by the EPA. The site represents a population oriented neighborhood scale monitoring area.

The trace level SO₂, CO, and NO_y analyzers began operation in January 2013.

The meteorological monitoring began at La Casa in January 2013.

PM₁₀ monitoring began at La Casa in January 2013. Currently, there is a pair of collocated low volume PM₁₀ samplers, and a Lo-Vol PM_{2.5} on the shelter roof. The Lo-vol PM₁₀ concentrations are very useful as they are used in conjunction with the PM_{2.5} measurements to calculate PM_{10-2.5} or coarse PM.

PM_{2.5} monitoring began at La Casa in January 2013 with an FRM filter based monitor, a continuous TEOM/FDMS FEM instrument, a supplemental PM_{2.5} speciation monitor, and a carbon speciation monitor. In early 2015, the TEOM/FDMS was replaced with a GRIMM EDM 180 continuous monitor,

which concurrently measures both PM₁₀ and PM_{2.5}.

PM₁₀/lead monitoring began in January 2013. Lead monitoring at LaCasa will be discontinued in 2016 due to extremely low concentrations measured at the site. EPA has removed the lead monitoring requirement from all NCore sites due to the low concentrations measured throughout the country. Ambient lead concentrations will still be measured at the PM_{2.5} speciation and IMPROVE sites throughout the state, as well as on the PM₁₀ sampler at Grand Junction Powell (08 077 0017) as part of the National Air Toxics Trends Stations project.

I-25 Denver, 913 Yuma Street (08 031 0027):

The I-25 Denver site is an EPA required near roadway NO₂ monitoring site. It was established in June 2013. It is measuring NO/NO₂/NO_x by chemiluminescence. Trace level CO, continuous particulates (with a GRIMM EDM 180), and meteorological parameters are also monitored here.

I-25 Globeville, 4905 Acoma Street (08 031 0028):

The I-25 Globeville site is a second EPA required near roadway NO₂ monitoring site. It was established Oct. 1st, 2015. It is measuring NO/NO₂/NO_x by chemiluminescence and a direct NO₂ measurement using Cavity Attenuated Phase Shift (CAPS) instrumentation. The site is also equipped with sensors to measure meteorological parameters and continuous PM₁₀ and PM_{2.5} with a GRIMM EDM 180 instrument.

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 O₃ Study. The original permanent site was located at the campground office. This site was later relocated 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 O₃ formation in the Denver metro area.

PM_{2.5} monitoring began at this site in 2004 with the installation of a continuous monitor, and was furthered by the addition of an FRM sequential filter based monitor in 2005. Meteorological monitoring began in April of 2004.

Castlewood Canyon, Castlewood Canyon State Park (08 035 0005):

The Castlewood Canyon site was added to the PM_{2.5} network in late 2013 as a replacement background concentration site for particulate monitoring. This site replaced the previous background site located in Elbert County. There are multiple sites in Colorado better situated to satisfy the PM_{2.5} background requirement, so this monitoring location was deemed redundant and completed sampling requirements as of December 31, 2014. The APCD will designate the White River IMPROVE site as the representative background PM_{2.5} monitoring location for the state of Colorado.

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

The United States Air Force Academy site was installed as a replacement maximum concentration O₃ monitor for the Chestnut Street (08 041 0012) site. Modeling in the Colorado Springs area indicates that high O₃ 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 Air Force Academy but away from any roads. This is a population oriented urban scale SLAMS monitor.

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

The 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 8th 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 8th 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.

In January of 2013 an SO₂ monitor was added to Highway 24 to meet monitoring criteria for an increased population found during the 2010 census. To supplement SO₂ monitoring at the site, APCD added an RM Young meteorological tower in August of 2014, which also includes an RH sensor.

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

The Manitou Springs ozone site is located 4 miles west of Colorado Springs. It was established because of concern that the high concentration urban O₃ area was traveling farther up the Fountain Creek drainage 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 city maintenance facility. It has not recorded any levels greater than the current standard. This is a population oriented neighborhood scale SLAMS monitor.

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

The Colorado College monitoring site was established in January, 2007 after the revised particulate regulations required that Colorado Springs needed a continuous PM_{2.5} monitor. The APCD elected to collocate the new PM_{2.5} monitor with the corresponding filter based monitors from the RBD site at the Colorado College location, which included an FRM PM_{2.5} monitor and added a low volume FEM PM₁₀ monitor in November, 2007. The continuous monitor began operation in April of 2008.

The nearest representative meteorological site is located at the Highway 24 monitoring site. 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 (PM₁₀ and PM_{2.5}) and one that is a special purpose monitor (PM_{2.5} continuous).

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 7th Avenue and Macon Street. The Macon Street site was relocated to the top of the City Hall building in October of 2004.

The Cañon City PM₁₀ site began operation in December 1987. On May 6, 1988, the Macon Street monitor recorded a PM₁₀ concentration of 172 µg/m³. This is the only exceedance of either the 24-hour or annual NAAQS since PM₁₀ monitoring was established at Cañon City. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 6 day sample schedule.

Parachute Elementary School, 100 E. 2nd Street (08 045 0005):

The Parachute site began operation in May 2000 with the installation of a PM₁₀ monitor at the local elementary school. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

Rifle - Henry Building, 144 3rd Street (08 045 0007):

The first Rifle site began monitoring for particulates 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 downtown began operation in May of 2005 with the installation of a PM₁₀ monitor as a part of the Garfield County study. This site now includes two population oriented neighborhood scale special purpose PM₁₀ monitoring sites: one time-integrated high volume filter based sampler on a 1 in 3 day sample schedule and one that is continuous. The continuous particulate monitor measures both PM_{2.5} and PM₁₀. Additionally, this site includes a meteorological tower.

Rifle – Health Dept., 195 14th Ave (08 045 0012):

The Rifle Health site is located at the Garfield County Health Department building. The site is approximately 1 kilometer 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 O₃ 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 SLAMS site with a neighborhood scale.

Carbondale, 1493 County Road 106 (08 045 0018):

Carbondale is in the fairly narrow Roaring Fork valley between Aspen and Glenwood Springs. The Carbondale site is located just south of the confluence of the Crystal and Roaring Fork rivers and was established to monitor PM₁₀ in January of 2013. This is a population oriented neighborhood scale special purpose monitoring site.

Crested Butte, 603 6th Street (08 051 0004):

The Crested Butte PM₁₀ site began operation in June 1985. Crested Butte is a high mountain ski town located approximately 30 miles north of Gunnison, Colorado. 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 PM₁₀.

This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule with a collocated sampler on a 1 in 6 day sample schedule.

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 PM₁₀ site that had several high PM₁₀ concentrations including five exceedances of the 24-hour standard in 1997 and one in 1998. Mt. Crested Butte also exceeded the PM₁₀ annual average standard in 2011. A CMB source apportionment from 10 PM₁₀ filters identified a crustal material as the most likely source (91%) of PM₁₀. 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 PM₁₀. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

Arvada, 9101 57th 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 high concentration urban O₃ area. As a result, when conditions are proper for daylong O₃ 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. In the 5-Year Network Assessment Plan the Arvada site was deemed to be redundant. The last valid O₃ sample was taken 12/31/2011, and the instrument was removed shortly after that. Meteorological monitoring began in 1975 and continues today.

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

The APCD conducted a short-term O₃ 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 O₃ 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. This is a population oriented urban scale SLAMS monitor.

Rocky Flats North, 16600 W. Highway 128 (08 059 0006):

The Rocky Flats - N site is located north-northeast of the former plant on the south side of Colorado Highway 128, approximately 1¼ miles to the west of Indiana Street. The site began operation in June of 1992 with the installation of an O₃ monitor and meteorological monitors as a part of the first phase of the APCD's monitoring effort around the Rocky Flats Environmental Technology Site.

O₃ monitoring began as a part of the Summer 1993 Ozone Study. The monitor recorded some of the highest O₃ levels of any of the sites during that study. Therefore, it was included as a regular part of the APCD O₃ monitoring network. The Rocky Flats - N monitor frequently exceeds the current standard. This is a highest concentration oriented urban scale SLAMS monitor.

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 Summer 1993 Ozone Study. Based on the elevated concentrations found at this location during the study, it was made a permanent monitoring site in 1994. This site typically records some of the higher eight-hour O₃ concentrations in the Denver area. It frequently exceeds the current standard.

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 O₃ levels. In addition, passive O₃ monitors used in the area in a 2007 study indicated the possibility of higher O₃ levels. The monitor is located in an urban setting at a Park and 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 O₃ levels that are larger than those seen in the metro area, as O₃ 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 SLAMS neighborhood scale monitor.

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 (1,981 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 site is equipped with a high volume PM₁₀ sampler and is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

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 PM₁₀ and a PM_{2.5}, that sample on a 1 in 3 day sample schedule. There is also continuous monitor measuring PM₁₀ and PM_{2.5}.

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

The Fort Collins-West ozone monitor began operation in May of 2006. The location was established based on modeling and to satisfy permit conditions for a major source in the Fort Collins area. The levels recorded for the first season of operation showed consistently higher concentrations than the 708 S. Mason Street monitor. This is a highest concentration oriented urban scale SLAMS monitor.

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 State Maintenance Plan (SMP) for the area. It is a population oriented neighborhood scale SLAMS monitor.

O₃ monitoring began in 1980, and continues today.

Meteorological monitoring began at the site January 1st, 1981. In March 2012 the meteorological tower was relocated from a freestanding tower on the west side of the shelter to a shelter mounted tower on the south side of the shelter due to the Mason Street Redevelopment Project.

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. This 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 PM₁₀ as well as for 24-hour and hourly PM_{2.5}.

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 APCD felt that a location nearer to the 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 3.3 ppm in 2003. This is a population oriented, micro-scale SLAMS monitor.

Meteorological monitors were installed in 2004, and include wind speed, wind direction, and temperature sensors. The meteorological tower was outfitted January 5th, 2015 with RM Young meteorological sensors, including a RH sensor.

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 O₃ 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.

Elk Springs, 33902 US Hwy 40 (08 081 0002):

One of the recommendations of the 3-State Network Assessment was to move the Lay Peak site further to the north and to the west. Elk Springs, 35 miles west was found to be a suitable location. The Lay Peak site completed sampling requirements and all sampling equipment was taken offline as of December 31st, 2014. The Elk Springs site became operational and began monitoring for ozone and meteorological parameters August 1st 2015. The purpose for this site and other Three State Study sites is for the development of monitoring data sets in geographic areas that have no monitoring data to support modeling efforts in NEPA assessments and in determinations of NAAQS compliance. The surrounding terrain is high desert, dominated by sagebrush, pinion pines, and riparian vegetation. The site is in open terrain with a 360-degree exposure. There are no significant sources nearby, however, the oil and gas development potential is high for lands to the north and east of the site, and development of these resources is expected to increase in the future.

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.

The O₃ monitor was established to address community concerns of possible high O₃ from oil and gas and power plant emissions in the area. Many of these sources are in New Mexico. Ozone monitoring commenced in May 2008 and the first PM_{2.5} filter was sampled June 20th, 2008. PM_{2.5} monitoring was discontinued at the site in July of 2015 due to the site completing sampling requirements and the site returning low PM_{2.5} concentrations. This site is an urban scale SLAMS monitor.

Paradox, 7250 County Road 5, Paradox, CO (08 085 0005):

One of the recommendations from the 3-State Study Network Assessment was the inclusion of a new ozone site in or near the Paradox Valley. As a result of that study, the APCD investigated the area and found a suitable location on a Colorado Department of Transportation property just to the south and east of the town of Paradox Colorado near the Utah-Colorado border. The purpose for this site and other Three State Study sites is for the development of monitoring data sets in geographic areas that have no monitoring data to support modeling efforts in NEPA assessments and in determinations of NAAQS compliance. This site began monitoring for ozone and meteorological parameters including precipitation measurements in March of 2016.

Aspen Yellow Brick School, 215 North Garmisch (08 097 0008):

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 PM₁₀, 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 is currently a high volume filter based PM₁₀ monitor and a continuous PM₁₀/PM_{2.5} monitor operated at this site.

The population oriented neighborhood scale SLAMS monitor is operating on a 1 in 3 sample schedule.

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 was located on the northern edge of town (until it was decommissioned in 2012) while the Municipal site is near the center of the town. Both sites have recorded exceedances of the 24-hour standard of 150 µg/m³, and both sites regularly record values above 100µg/m³ as a 24-hour average. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

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 APCD first established a meteorological monitor in Lamar at the Municipal Building but this location was too protected and the meteorological monitor was moved to the Port of Entry location in March of 2005 where it still operates today.

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 2011 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 2011. The distance and traffic estimate for the surrounding streets falls into the middle scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D.

Steamboat Springs, 136 6th 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 6th 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 site monitors for PM₁₀ with high volume filter based sampling. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

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.

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

The Greeley PM₁₀ and PM_{2.5} monitors are on the roof of a hospital office building at 1516 Hospital Road. The site currently has a Low Volume filter based FRM PM_{2.5} monitor and a TEOM continuous PM_{2.5} monitor. Data from this continuous TEOM particulate monitor is not compared with the NAAQS. It is used for short term forecasting and public notifications. 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 5 mph. Secondary winds are from the north, north-northwest and east-southeast, with the most frequent wind speeds also being less than 5 mph. 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.

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 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 will burn off. This is due to solar heating. The upslope/down slope Platte River Valley drainage and wind flows between Denver and Greeley making Platteville a good place to monitor PM_{2.5}. These characteristics also make it an ideal location for chemical speciation sampling, which began at the end of 2001 and is currently still monitoring.

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 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 PM_{2.5} filter based FRM 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.

Greeley, Weld County Tower, 3101 35th Avenue (08 123 0009):

The Weld County Tower O₃ monitor began operation in June 2002. The site was established after the 811 15th 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 Greeley West Annex carbon monoxide monitoring site was dismantled in June of 2015 and moved to the Weld County Tower site. Carbon Monoxide monitoring began at the Weld County Tower site in April of 2015 with a Thermo 48C monitor. The CO monitor at Weld County Tower was switched from a Thermo 48C to a Thermo 48i-tle trace level analyzer on April 28th, 2016.

Meteorological monitoring began in February of 2012.

Appendix B- Boulder Reservoir Network Modification



Dedicated to protecting and improving the health and environment of the people of Colorado

Richard Payton
8P-AR
US Environmental Protection Agency Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Date: 10/21/15

Dear Mr. Payton,

The Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) is submitting two network site modification request forms for the proposed commissioning of ozone and meteorological monitoring at Boulder Reservoir and the decommissioning of ozone monitoring at South Boulder Creek (08-013-0011). The Boulder Reservoir site has been selected as a replacement location to APCD's South Boulder Creek site. The South Boulder Creek site began operation in 1993 and was selected to measure air pollution in the Boulder area. This site is currently located at 1405 ½ South Foothills Highway, at an old City of Laffayette water treatment facility. This site was adversely impacted by flooding in 2013 and has been increasingly impacted by the surrounding vegetation to the point that it no longer meets federal siting criteria. This pending relocation has been acknowledged by APCD in the 2014 and 2015 Annual Network Plans. The APCD believes that given the current circumstances at the South Boulder Creek site, the site should be relocated in the north Boulder area. The continuation of air quality monitoring in the Boulder area is critical to protect the health and welfare of the citizens within the Boulder area.

The proposed site at Boulder Reservoir is located approximately 75 meters east of the park's maintenance facility. Attachment 1 shows a Google Earth photo of the proposed site in relation to the main entrance area of the park. Attachment 2 shows a close-up Google Earth photo of the proposed site location.

This letter and the enclosed network modification forms (Attachment 3 and 4) were made available for a 30 day public comment period from 9/17/15 to 10/17/15. No comments were received.

We welcome your consideration of our request and look forward to talking with you in the future. I thank you for your time and I am available to answer any questions you may have.

Regards,

A handwritten signature in black ink that reads 'Larry Wolk'.

4300 Cherry Creek Drive S., Denver, CO 80246-1530 P 303-692-2000 www.colorado.gov/cdphe
John W. Hickenlooper, Governor | Larry Wolk, MD, MSPH, Executive Director and Chief Medical Officer



Gregory Harshfield
Colorado Department of Public Health and Environment
Air Pollution Control Division
Continuous Monitoring Supervisor
APCD-TS-B1
4300 Cherry Creek Drive South
Denver, CO 80246
303-692-3232
gregory.harshfield@state.co.us

Enclosures:

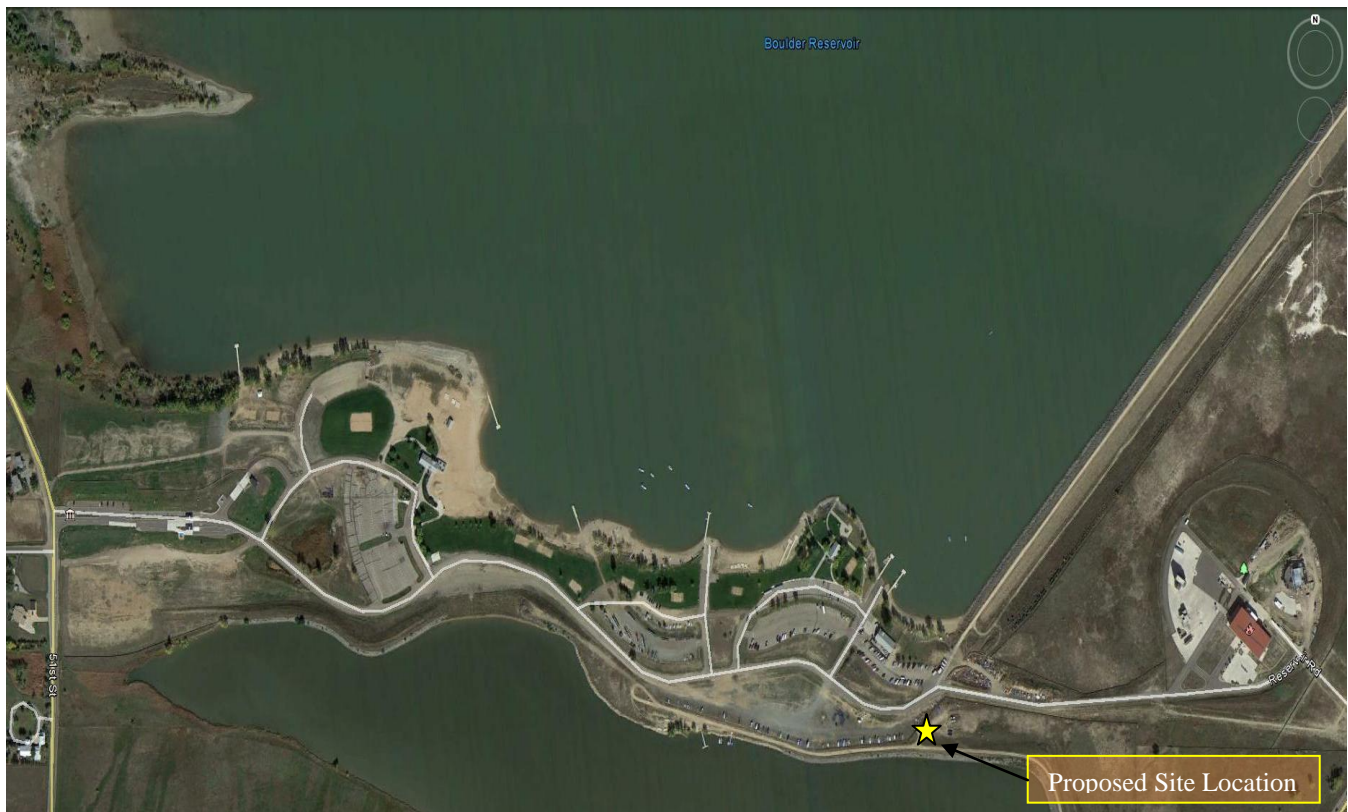
Attachment 1: Boulder Reservoir Overview Map

Attachment 2: Site Location at Boulder Reservoir

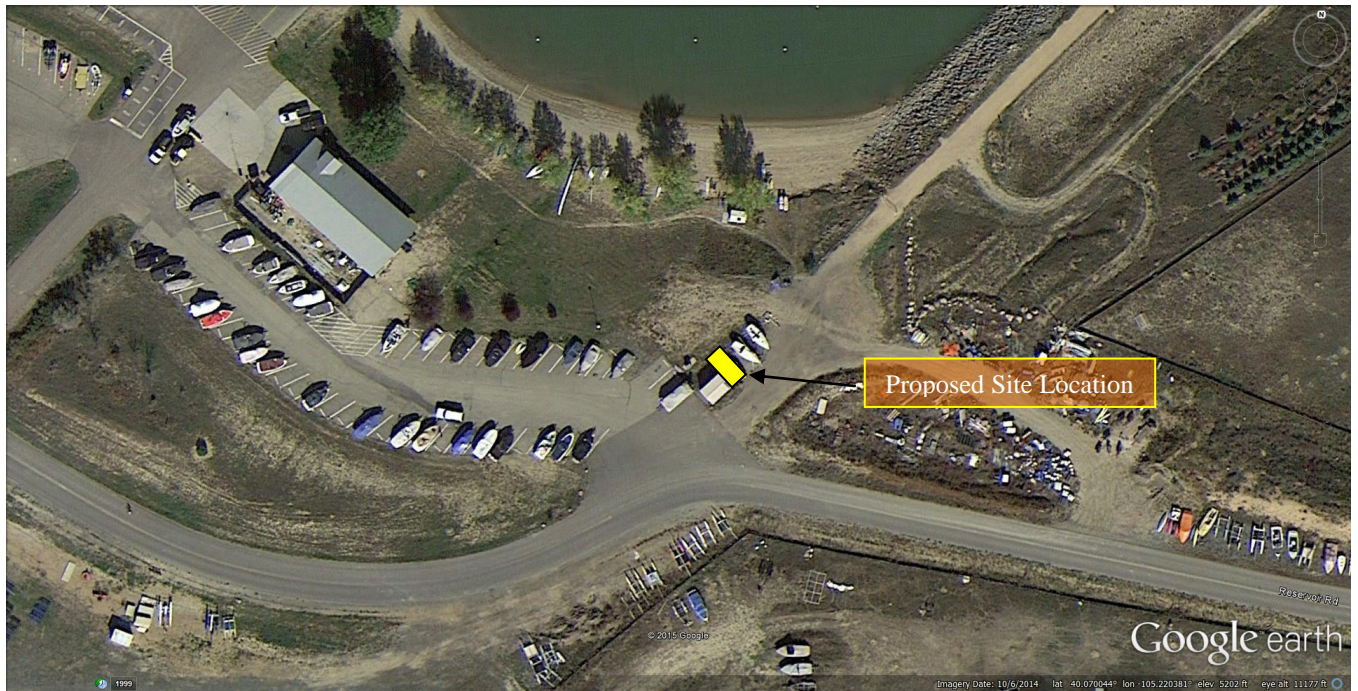
Attachment 3: Boulder Reservoir - Ambient Air Monitoring Network Modification Form

Attachment 4: South Boulder Creek - Ambient Air Monitoring Network Modification Form

Attachment 1. Boulder Reservoir

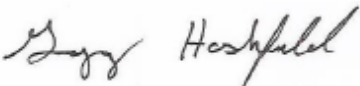


Attachment 2. Site Location at Boulder Reservoir



Attachment 3. Boulder Reservoir Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 9/15/2015		CITY: 5565 N. 51 st Street, Boulder, CO 80301			STATE: CO	
AQS SITE ID: 08-013-0014 (? - next available in series)			SITE NAME: Boulder Reservoir			
<p>PROPOSED MODIFICATION/REASON WHY: The APCD is proposing to relocate the South Boulder Creek air monitoring site approximately 8 miles NNE of its current location. The South Boulder Creek site is currently located at 1405 1/2 South Foothills Highway, at an old City of Lafayette water treatment facility. This site is being relocated because of encroaching vegetation (trees) that make the site no longer compliant with EPA siting criteria. Due to the amount of vegetation impacting the site, it has been determined that the relocation of the site is the most prudent option. This recommendation has been identified in CDPHE's 2014 and 2015 Annual Network Plans. The new location will be at Boulder Reservoir, approximately 75 meters east of the park's maintenance facility.</p>						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (HAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
Ozone	SLAMS	X				API 400E
Met Tower	SPM					Met One
PROPOSED SAMPLING START: Anticipated Start Date 1/1/16						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:						
LOCATION (LAT./LONG. OR UTM'S): Lat 40.070016 Long -105.220238 WGS84						
SITE ELEVATION (M. MSL): 1586 Meters				PROBE HEIGHT (M. AGL): TBD		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
30 Meters	North	No obstacles at site.				
34 Meters	North Northeast					
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA 360 DEG.						
DISTANCE TO FLUES/INCINERATORS (M): 350 Meters to Boulder County Regional Fire Training Facility. (Propane, Wood Pallets fuel sources - infrequent burns)						
DISTANCE TO INTERSECTIONS (M): 1280 Meters Hwy 199 and 63 rd Street			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. ___TBD___ HORIZ. ___TBD___			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
~ 540 Meters	Hwy. 119, Diagonal Hwy	SOUTHEAST	~42,000	2014	MAJOR ST OR HY	
1270 Meters	51 st Street	WEST	~1,800	2012	Arterial, Paved	
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS	
0.35 km -Boulder County Regional Fire	Propane and Wood					

Training Facility	Pallet combustion			
NOx - 1.3 km (Lockheed Martin, 6.7 tpy) NOx - 2.9 km (IBM, 123.5 tpy)	East Southeast Northeast			
VOC - 0.7 km (Covidien LP, 1.9 tpy)	South Southeast			
<p>CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.</p> <p style="text-align: center;">  Printed Name: Gregory Harshfield Signature: </p>				
<p>FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status Given: _____ Email Response Date: _____ Letter Response Date: _____</p>				

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES: Monitor meteorology to assess ozone monitoring results.

PROPOSED MONITORING SCHEDULE/DURATION: Continuous, as long as ozone is run.

PROPOSED START / REMOVAL DATE
OR DATE STARTED / REMOVED: Anticipated Start Date = 1/1/2016

DATA ACQUISITION SYSTEM:

PRIMARY	ESC 8832	PARAMETERS:	APPLICABLE ✓ those that apply	SENSOR HT (M)
BACKUP	None	WIND SPEED/DIRECTION	Yes	10
EQUIPMENT MANUFACTURER/MODEL:		SOLAR RADIATION	No	
		RELATIVE HUMIDITY	No	
WILL THE DATA BE USED FOR MODELING?	<u>YES</u> NO	PRESSURE	No	
IS SITE REQUIRED FOR SIP?	YES <u>NO</u>	SIGMA THETA	Yes	10
UNRESTRICTED AIRFLOW?	<u>YES</u> NO	PRECIPITATION	No	
DISTANCE TO TREE DRIPLINE (M):	30 Meters.	TEMPERATURE	Yes	2
NEARBY TERRAIN:	SMOOTH <u>ROLLING</u> ROUGH	OTHER (DESCRIBE)		

TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):

Rolling terrain with hills.

COMMENTS:

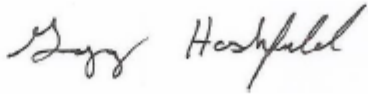
FORM KEY:

PAGE 1:

MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A
 SITE ELEVATION = GROUND LEVEL ELEVATION
 PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL

Attachment 4. South Boulder Creek Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 9/15/2015		CITY: 1405 ½ South Foothills Highway (Hwy. 93), Boulder			STATE: CO	
AQ5 SITE ID: 08-013-0011			SITE NAME: South Boulder Creek			
<p>PROPOSED MODIFICATION/REASON WHY: The APCD is proposing to relocate the South Boulder Creek air monitoring site approximately 8 miles NINE of its current location. This site is being relocated because of encroaching vegetation (trees) that make the site no longer compliant with EPA siting criteria. Due to the amount of vegetation impacting the site, it has been determined that the relocation of the site is the most prudent option. This recommendation has been identified in CDPHE's 2014 and 2015 Annual Network Plans. The new location will be at Boulder Reservoir, approximately 75 meters east of the park's maintenance facility.</p>						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
Ozone	SLAMS	X				API 400E
PROPOSED CLOSE DATE: Anticipated Close Date 1/1/16						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:						
LOCATION (LAT./LONG. OR UTM'S): Lat 39.957192 Long -105.238487 WGS84						
SITE ELEVATION (M. MSL): 1671 Meters				PROBE HEIGHT (M. AGL): 4.3 Meter		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
16 meters (tree 1030)	West Southwest	16 meters	West Southwest	10.7 meters	Tree 1030	
18 meters (tree 1031)	West Northwest	18 meters	West Northwest	11.9 meters	Tree 1031	
20 meters (tree 1034)	East Northeast	20 meters	West Southwest	12.2 meters	Tree 1034	
UNRESTRICTED AIR FLOW: >270 DEG. X >180 DEG. <CRITERIA ___~180___DEG.						
DISTANCE TO FLUES/INCINERATORS (M): None						
DISTANCE TO INTERSECTIONS (M): 676 Meters Hwy 93 and Eldorado Springs Dr.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT._1.5 meter, HORIZ._0.5 meter			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
~ 408 Meters	Hwy. 93	East Northeast	~16,000	2014	MAJOR ST OR HWY	
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS	
NOx - 3.8 km (Public Service-Compressor, 17 tpy)	East					

VOC - 3.1 km (King Soopers Fueling, 8 tpy)	North Northeast			
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.				
Printed Name: Gregory Harshfield		Signature: 		
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status Given: _____ Email Response Date: _____ Letter Response Date: _____				

FOR METEOROLOGICAL PARAMETERS ONLY:			
MONITORING PURPOSE/OBJECTIVES:			
PROPOSED MONITORING SCHEDULE/DURATION:			
PROPOSED START / REMOVAL DATE OR DATE STARTED / REMOVED:			
DATA ACQUISITION SYSTEM:			
PRIMARY None	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP None	WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:	SOLAR RADIATION		
	RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE		
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		
TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):			
COMMENTS:			
FORM KEY: PAGE 1: MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A SITE ELEVATION = GROUND LEVEL ELEVATION PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL			

Appendix C- Particulate Matter Monitoring Network Modification

STATE OF COLORADO

John W. Hickenlooper, Governor
Christopher E. Urbina, MD, MPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

Date: May 12, 2016

Richard Payton
8P-AR
US Environmental Protection Agency Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Mr. Payton,

As required, the Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) is submitting a number of network site modification request forms for proposed network changes. Site names, AQS ID and proposed actions are as follows:

New Adams County site – 08-001-000x (4201 E 72nd Ave.)

- Install speciation
- Install GRIMM EDM 180 (primary)
- Install PM2.5 FRM collocated sampler
- Install PM10 low volume sampler

La Casa – 08-031-0026

- Remove PM10 low volume collocated
- Discontinue primary and collocated Pb analysis

I-25 Yuma - 08-031-0027

- Remove PM2.5 FRM sampler

Colorado College – 08-041-0017

- Install GRIMM EDM 180 (primary)
- Remove PM2.5 FRM
- Remove PM2.5 TEOM

Ft. Collins, CSU Facilities – 08-069-0009

- Remove PM2.5 FRM

- Establish GRIMM EDM 180 as primary

Powell – 08-077-0017

- Remove PM2.5 FRM
- Establish GRIMM EDM 180 as primary

Greeley Hospital – 08-123-0006

- Remove PM2.5 FRM
- Remove PM2.5 TEOM
- Establish GRIMM EDM 180 as primary

New Adams County site – AQS ID: 08-001-000x (4201 E 72nd Ave.)

The proposed Adams County site at 4201 E 72nd Avenue is almost immediately north of the now closed Alsup Elementary site (08-001-0006) and just slightly west of the former Adams City site (08-001-0001). It is expected that the new site will largely maintain the monitoring structure as the Alsup site with the following exceptions:

- The EDM 180 will be established as the primary PM2.5 sampler.
- The PM2.5 FRM sampler will be established as the collocated – the site will serve as APCD’s only official GRIMM collocation site.
- The collocated PM2.5 instrument will be removed as it no longer serves any purpose, according to EPA’s current reading of collocation guidelines (PM2.5 FRM collocation requirements will be maintained at APCD’s CAMP site).

La Casa - AQS ID: 08-031-0026

With the recent rule change regarding lead monitoring and Colorado’s demonstration exceeding the limits established to discontinue Pb analysis there is no reason to maintain the collocated PM10 instrument at La Casa. Colorado will still report PM10-2.5, from the site on an every third day frequency. The PM10-2.5 monitoring requires that the PM2.5 FRM be maintained as the primary PM2.5 sampler. PM10 low volume collocation requirements will be met with ongoing PM10 low volume collocation at APCD’s Powell site in Grand Junction.

I-25 Yuma – AQS ID: 08-031-0027

APCD will remove the redundant PM2.5 FRM sampler and the GRIMM EDM 180 will be designated as the primary PM2.5 instrument.

Colorado College – AQS ID: 08-041-0017

Installing a GRIMM EDM 180 will afford APCD the ability to remove the PM2.5 TEOM and the PM2.5 FRM from the site. The physical PM2.5 FRM sampler (R&P 2015) will be reconfigured to sample PM10, eliminating the only 126 method code from APCD’s network.

Ft. Collins, CSU Facilities – AQS ID: 08-069-0009

The installation of the GRIMM EDM 180 made the PM2.5 FRM sampler redundant and, it will be removed.

Powell – AQS ID: 08-077-0017

The installation of the GRIMM EDM 180 made the PM2.5 FRM sampler redundant and, it will be removed.

Greeley Hospital – AQS ID: 08-123-0006

Installing a GRIMM EDM 180 will make the PM2.5 FRM redundant and, it will be removed.

Enclosed are the associated Ambient Air Monitoring Network Modification Request Forms. If you have any questions or need further information, you can reach me at (303) 692-3235.

Sincerely,



Patrick R. McGraw
Particulate Monitoring Supervisor

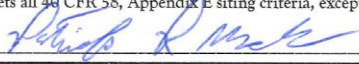
cc: Gordon Pierce

Enclosures:

- Attachment 1: New Adams County site - Ambient Air Monitoring Network Modification Form
- Attachment 2: La Casa - Ambient Air Monitoring Network Modification Form
- Attachment 3: I-25 Yuma - Ambient Air Monitoring Network Modification Form
- Attachment 4: Colorado College - Ambient Air Monitoring Network Modification Form
- Attachment 5: Ft. Collins, CSU Facilities – Air Quality Monitoring Network Modification
- Attachment 6: Powell – Air Quality Monitoring Network Modification
- Attachment 7: Greeley Hospital – Air Quality Monitoring Network Modification

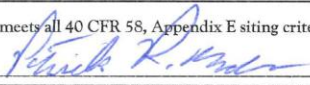
Attachment 1

Adams County - Ambient Air Monitoring Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Commerce City			STATE: CO	
AQS SITE ID: 08-001-000x			SITE NAME: Adams County			
PROPOSED MODIFICATION/REASON WHY: Replacement site for the Alsup Elementary site, which closed May 27, 2015.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PM2.5	SLAMS	X		X		GRDM EDM 180
PM10	SPM			X		R&P 2025 Primary & Collocated
STN	CSN					MetOne SASS, URG 2000N
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Sampling Start Date 07/01/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:						
LOCATION (LAT./LONG. OR UTM'S): Lat = 39.82835 Long = -104.93836 WGS84						
SITE ELEVATION (M. MSL): 1574 Meters				PROBE HEIGHT (M. AGL): 15 Meters		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
n/a	n/a	5 M	East	0.5 M	A/C unit	
UNRESTRICTED AIR FLOW: >270 DEG						
DISTANCE TO FLUES/INCINERATORS (M): Not applicable.						
DISTANCE TO INTERSECTIONS (M): See below			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. 0 HORIZ. 0			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
56 Meters	Colorado Blvd	WNW	7199	2014	Major St	
127 Meters	72 nd Avenue	South	4399	2014	LOCAL ST	
DISTANCE TO NEAREST POINT SOURCES (MILES)		DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS
Not Applicable.			0.25		West	Gravel Pits
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw		Signature: 				
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status: _____						
Given: _____ Email Response Date: _____ Letter Response Date: _____						

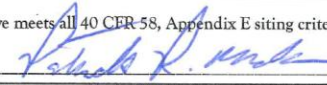
Attachment 2

La Casa - Ambient Air Monitoring Network Modification Form

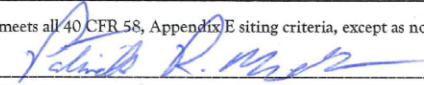
EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Denver			STATE: CO	
AQS SITE ID: 08-031-0026			SITE NAME: La Casa			
PROPOSED MODIFICATION/REASON WHY: Final lead monitoring requirements obviate need for collocated PM10 monitoring, PM10 Low-Vol instrument will be removed. Site configuration will otherwise remain unchanged. Changes will be effective 7/1/2016						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Removal Date 7/1/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS: All remain unchanged						
LOCATION (LAT./LONG. OR UTM' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA 360 DEG.						
DISTANCE TO FLUES/INCINERATORS (M): Not Applicable.						
DISTANCE TO INTERSECTIONS (M): See Below.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. 0.8 HORIZ. 1			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS	
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw			Signature: 			
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status: _____ Given: _____ Email Response Date: _____ Letter Response Date: _____						

Attachment 3

I-25 Yuma - Ambient Air Monitoring Network Modification Form

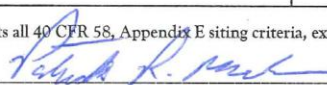
EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Denver			STATE: CO	
AQS SITE ID: 08-031-0027			SITE NAME: I-25 Yuma			
PROPOSED MODIFICATION/REASON WHY: GRIMM EDM 180 makes PM2.5 FRM redundant, will remove PM2.5 FRM instrument (RP 2015). GRIMM instrument will be designated as primary. Site configuration will otherwise remain unchanged.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Sampling Start/Removal Date 7/1/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS: All remain unchanged						
LOCATION (LAT./LONG. OR UTM' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA ___360___ DEG.						
DISTANCE TO FLUES/INCINERATORS (M): Not Applicable.						
DISTANCE TO INTERSECTIONS (M): See Below.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. ___0.8___ HORIZ. ___1___			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)	DIRECTION TO AREA SOURCES	COMMENTS		
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR-58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw		Signature: 				
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status: _____ Given: _____ Email Response Date: _____ Letter Response Date: _____						

Attachment 4
Colorado College - Ambient Air Monitoring Network Modification Form

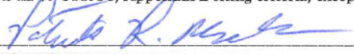
EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Colorado Springs			STATE: CO	
AQS SITE ID: 08-041-0017			SITE NAME: Colorado College			
PROPOSED MODIFICATION/REASON WHY: Installation of GRIMM EDM 180 will make all other PM2.5 measurements redundant, will remove PM2.5 FRM, PM2.5 TEOM, and reclassify GRIMM as primary PM2.5.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PM2.5	SLAMS			X		GRIMM EDM 180
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Sampling Start/Removal Date 7/1/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS: All remain unchanged						
LOCATION (LAT./LONG. OR UTM' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA 360 DEG.						
DISTANCE TO FLUES/INCINERATORS (M): Not Applicable.						
DISTANCE TO INTERSECTIONS (M): See Below.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. 0.8 HORIZ. 1			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS	
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw			Signature: 			
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status: _____ Given: _____ Email Response Date: _____ Letter Response Date: _____						

Attachment 5

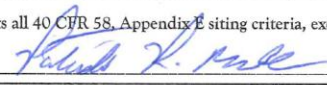
Ft. Collins, CSU Facilities - Ambient Air Monitoring Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Ft. Collins			STATE: CO	
AQS SITE ID: 08-069-0009			SITE NAME: Ft. Collins, CSU Facilities			
PROPOSED MODIFICATION/REASON WHY: Installation of GRIMM EDM 180 has made all other PM2.5 measurements redundant, will remove PM2.5 FRM and reclassify GRIMM as primary PM2.5. Site configuration will otherwise remain unchanged.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PM2.5	SLAMS			X		GRIMM EDM 180
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Sampling Removal Date 7/1/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS: All remain unchanged						
LOCATION (LAT./LONG. OR UTM' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA 360 DEG.						
DISTANCE TO FLUES/INCINERATORS (M): Not Applicable.						
DISTANCE TO INTERSECTIONS (M): See Below.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. 0.8 HORIZ. 1			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)	DIRECTION TO AREA SOURCES	COMMENTS		
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw		Signature: 				
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status: _____ Given: _____ Email Response Date: _____ Letter Response Date: _____						

Attachment 6 Powell - Ambient Air Monitoring Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Grand Junction			STATE: CO	
AQS SITE ID: 08-077-0017			SITE NAME: Powell			
PROPOSED MODIFICATION/REASON WHY: : Installation of GRIMM EDM 180 has made all other PM2.5 measurements redundant, will remove PM2.5 FRM instrument and reclassify GRIMM as primary PM2.5. Site configuration will otherwise remain unchanged.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PM2.5	SLAMS			X		GRIMM EDM 180
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Sampling Removal Date 7/1/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS: All remain unchanged						
LOCATION (LAT./LONG. OR UTM' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA_____360_____DEG.						
DISTANCE TO FLUES/INCINERATORS (M): Not Applicable.						
DISTANCE TO INTERSECTIONS (M): See Below.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT.____0.8____HORIZ.____1____			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS	
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw			Signature: 			
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status _____ Given: _____ Email Response Date: _____ Letter Response Date: _____						

Attachment 7
Greeley Hospital - Ambient Air Monitoring Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5/1/2016		CITY: Greeley			STATE: CO	
AQS SITE ID: 08-123-0006			SITE NAME: Greeley Hospital			
PROPOSED MODIFICATION/REASON WHY: Installation of GRIMM EDM 180 will make all other PM2.5 measurements redundant, will remove PM2.5 FRM instrument, PM2.5 TEOM, and classify GRIMM as primary PM2.5.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
PM2.5	SLAMS			X		GRIMM EDM 180
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Sampling Start/Removal Date 7/1/2016						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS: All remain unchanged						
LOCATION (LAT./LONG. OR UTM ' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA 360 DEG.						
DISTANCE TO FLUES/INCINERATORS (M): Not Applicable.						
DISTANCE TO INTERSECTIONS (M): See Below.			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. 0.8 HORIZ. 1			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS	
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						
Printed Name: Patrick R. McGraw			Signature: 			
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status: _____ Given: _____ Email Response Date: _____ Letter Response Date: _____						

Appendix D – Paradox Site Modification



Dedicated to protecting and improving the health and environment of the people of Colorado

Richard Payton
8P-AR
US Environmental Protection Agency Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Date: May 15, 2016

Dear Mr. Payton,

As requested, the Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) is submitting one network site modification request form for the commissioning of the Paradox air monitoring site. Sites common name, AQS ID and proposed actions are as follows:

Paradox (Montrose County)

AQS ID: 08-085-0005

Address: 7250 County Rd 5, Paradox, CO
Addition - Ozone Special Purpose Monitor
Addition - Meteorological

The APCD is including one network modification form for the newly installed special purpose Paradox site. This site is located a Colorado Department of Transportation maintenance facility, approximately 2 miles southeast of Paradox along State Highway 90, at lat: 38.342767, lon: -108.944960. This site was installed in support of the state and federal agencies' Three-State Air Quality Study (3SAQS) Pilot Project. Upon completion of the pilot study in 2013, agencies involved in the 3SAQS performed a network assessment to optimize monitoring resources for the 2015 - 2018 study period. From this network assessment study it was determined that there are large unmonitored areas in western Colorado. In response to this finding, the Paradox site was identified as a suitable location to address a large unmonitored area between Grand Junction and Cortez. This site became operational March 1, 2016.

This letter is being included as an attachment to the 2016 Network Plan which has been made available for a 30 day public comment period prior to submittal to the Environmental Protection Agency (EPA). Enclosed are the associated Ambient Air Monitoring Network Modification Request Form. If you have any questions or need further information, you can reach me at (303) 692-3232.

Sincerely,

A handwritten signature in black ink that reads 'Gregory Harshfield'.

Gregory Harshfield
Continuous Monitoring and Data Systems Support Supervisor

Attachment 1

Paradox (open) - Ambient Air Monitoring Network Modification Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM

(VERSION 2, 4/1/04)

DATE: 5/15/16

CITY: 7250 County Road 5, Rural Area 2 Miles SW of Paradox

STATE: CO

AQS SITE ID: 08-085-0005

SITE NAME: Paradox

PROPOSED MODIFICATION/REASON WHY: This site was installed in support of the state and federal agencies' Three-State Air Quality Study (3SAQS) Pilot Project. Upon completion of the pilot study in 2013, agencies involved in the 3SAQS performed a network assessment to optimize monitoring resources for the 2015 - 2018 study period. From this network assessment study it was determined that there are large unmonitored areas in western Colorado. In response to this finding, the Paradox site was identified as a suitable location to address a large unmonitored area between Grand Junction and Cortez. This site became operational March 1, 2016.

AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
Ozone	SPM				X	Thermo 49C
Met Tower	SPM					RM Young

PROPOSED SAMPLING START: Anticipated Start Date 3/1/16

ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:

LOCATION (LAT./LONG. OR UTM'S): Lat 38.342767 Long -108.944960 WGS84

SITE ELEVATION (M. MSL): 1582 Meters

PROBE HEIGHT (M. AGL): 4.1 M

DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS
No trees at site					
No obstacles at site.					

UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA___360_____DEG.

DISTANCE TO FLUES/INCINERATORS (M): Not applicable

DISTANCE TO INTERSECTIONS (M): 50 Meters

DISTANCE FROM SUPPORTING STRUCTURES (M):
VERT.____>1_____HORIZ.____>1____

DISTANCE TO	NAME OF	DAILY	YEAR OF TRAFFIC	TYPE OF

EDGE OF NEAREST ROADWAY	ROADWAY	DIRECTION	TRAFFIC ESTIMATES	ESTIMATES	ROADWAY	COMMENTS
		NORTH				
		EAST				
~ 50 Meters		SOUTH	1744	2014	MAJOR ST OR HY	CDOT OTIS
		WEST				
DISTANCE TO NEAREST POINT SOURCES (MILES)		DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS
None			None			

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: Gregory Harshfield

Signature:



FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status
Given: _____ Email Response Date: _____ Letter Response Date: _____

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES: Monitor meteorology to assess ozone monitoring results.

PROPOSED MONITORING SCHEDULE/DURATION: Continuous, as long as ozone is run.

PROPOSED START / REMOVAL DATE

OR DATE STARTED / REMOVED: 3/1/2016

DATA ACQUISITION SYSTEM: ESC 8816

PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
Run by Air Resource Specialists under state contract	WIND SPEED/DIRECTION	Yes	5.5 M
BACKUP None	SOLAR RADIATION		
EQUIPMENT MANUFACTURER/MODEL: RM Young	RELATIVE HUMIDITY	Yes	5.0M
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA	Yes	5.5 M

UNRESTRICTED AIRFLOW? <u>YES</u> NO	PRECIPITATION	Yes	4.3 M
DISTANCE TO TREE DRIPLINE (M): No trees in area.	TEMPERATURE	Yes	5.0 M
NEARBY TERRAIN: <u>SMOOTH</u> <u>ROLLING</u> ROUGH	OTHER (DESCRIBE)		
<p>TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):</p> <p>open valley and agriculture with hills to the south</p>			
<p>COMMENTS: Site will run by a local sub-contractor. Current primary contractor is Air Resource Specialists of Fort Collins, CO.</p>			
<p>FORM KEY:</p> <p>PAGE 1:</p> <p>MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A</p> <p>SITE ELEVATION = GROUND LEVEL ELEVATION</p> <p>PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL</p>			