

# STATE IMPLEMENTATION PLANS

## NCAR/ASP SUMMER COLLOQUIUM

July 26, 2016

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Air Pollution Control Division



# Topics

- ◉ National Ambient Air Quality Standards (NAAQS)
- ◉ Area Designations
- ◉ State Implementation Plans (SIP)
- ◉ Colorado's Ozone SIPs



*Maroon Bells - Snowmass Wilderness Area*



*Flat Tops Wilderness Area*



*Mount Zirkel Wilderness Area*



*Great Sand Dunes National Park and Preserve*





# NAAQS

- ◉ CAA requires EPA to set NAAQS for pollutants considered harmful to public health and environment
  - Primary standards - protect public health
  - Secondary - protect public welfare
- ◉ Criteria pollutants
  - Particulate matter, ozone, carbon monoxide, sulfur oxides, nitrogen oxides, lead
- ◉ Five year review

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary/ Secondary	Rolling 3 month ave	0.15 µg/m³	Not to be exceeded
Nitrogen Dioxide (NO2)		Primary	1 hour	100 ppb	98 <sup>th</sup> percentile of 1-hour daily max, ave over 3 years
		Primary/ Secondary	1 year	53 ppb	Annual mean
Ozone (O3)		Primary/ Secondary	8 hours	0.07 ppm	Annual 4 <sup>th</sup> highest daily max 8-hour, ave over 3 years
Particle Pollution (PM)	PM2.5	Primary	1 year	12.0 µg/m³	Annual mean, ave over 3 years
		Secondary	1 year	15.0 µg/m³	Annual mean, ave over 3 years
	PM10	Primary/ Secondary	24 hours	35 µg/m³	98 <sup>th</sup> percentile, ave over 3 years
		Primary/ Secondary	24 hours	150 µg/m³	Not to be exceeded more than once per year on ave over 3 years
Sulfur Dioxide (SO2)		Primary	1 hour	75 ppb	99 <sup>th</sup> percentile of 1-hour daily max, ave over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Final	Primary/ Secondary	Averaging Time	Level	Form
1971	Primary/ Secondary	1 hour	0.08 ppm	Not to be exceeded more than one hour per year
1979	Primary/ Secondary	1 hour	0.12 ppm	Attainment is defined as when the expected number of days per calendar year, with max hourly ave greater than 0.12 ppm is $\leq 1$
1993	EPA determined that revisions were not warranted			
1997	Primary/ Secondary	8 hours	0.08 ppm	Annual 4 <sup>th</sup> highest daily max 8-hour, ave over 3 years
2008	Primary/ Secondary	8 hours	0.075 ppm	Annual 4 <sup>th</sup> highest daily max 8-hour, ave over 3 years
2015	Primary/ Secondary	8 hours	0.070 ppm	Annual 4 <sup>th</sup> highest daily max 8-hour, ave over 3 years

# Colorado Ozone

**Table 3 – 8-Hour Ozone Three-Year Average 4th Maximum Ozone Values**

Site	3-yr. avg. 4 <sup>th</sup> max (ppm)							
	<u>2006– 08</u>	<u>2007– 09</u>	<u>2008– 10</u>	<u>2009– 11</u>	<u>2010– 12</u>	<u>2011– 13</u>	<u>2012– 14</u>	<u>2013– 15</u>
Welby	0.071	0.072	0.070	0.070	0.071	0.076	0.073	0.071
Highland	—	—	—	0.074	0.077	0.079	—	—
Aurora East	—	—	—	0.071	0.073	0.074	0.071	0.069
S. Boulder Ck.	<b>0.081</b>	<b>0.078</b>	0.073	0.073	0.074	0.077	0.075	0.074
CAMP	—	—	—	—	—	—	0.065	0.065
Carriage	0.073	0.070	0.068	0.069	0.073	—	—	—
DMAS NCore	—	—	0.065	0.065	0.069	—	—	—
La Casa NCore	—	—	—	—	—	—	—	0.069
Chatfield Park	<b>0.082</b>	<b>0.077</b>	<b>0.076</b>	<b>0.077</b>	<b>0.082</b>	<b>0.083</b>	<b>0.081</b>	<b>0.079</b>
Arvada	<b>0.078</b>	0.074	0.073	0.074	—	—	—	—
Welch	<b>0.078</b>	0.074	0.071	0.073	<b>0.076</b>	<b>0.078</b>	0.075	0.073
Rocky Flats–N	<b>0.086</b>	<b>0.082</b>	<b>0.078</b>	<b>0.078</b>	<b>0.080</b>	<b>0.083</b>	<b>0.082</b>	<b>0.079</b>
NREL	<b>0.081</b>	<b>0.076</b>	<b>0.072</b>	<b>0.075</b>	<b>0.079</b>	<b>0.082</b>	<b>0.080</b>	<b>0.080</b>
Aspen Park	—	—	—	0.070	0.074	0.075	0.073	0.070
NPS–Rocky Mountain NP	<b>0.076</b>	0.074	0.073	0.074	<b>0.077</b>	<b>0.076</b>	0.074	0.070
Fort Collins West	<b>0.082</b>	<b>0.078</b>	0.074	<b>0.076</b>	<b>0.078</b>	<b>0.080</b>	<b>0.078</b>	<b>0.077</b>
Rist Canyon	—	—	—	0.071	0.071	—	—	—
Fort Collins	0.071	0.066	0.065	0.065	0.069	0.072	0.073	0.071
EPA–Rocky Mountain NP	—	—	—	—	—	0.074	0.075	0.072
Weld Co. Tower	<b>0.076</b>	<b>0.071</b>	<b>0.071</b>	<b>0.072</b>	<b>0.076</b>	<b>0.076</b>	<b>0.074</b>	<b>0.072</b>

*Note: Bolded data are levels above the 75 ppb NAAQS.*



# Colorado Ozone

**Table ES-1 – 2012 – 2014 Ozone Values in the DMNFR Nonattainment Area**

Monitor	4th Max			
	2012	2013	2014	3-Year Average (2012-2014)
Rocky Flats North	84	85	77	82
Chatfield Park	86	83	74	81
NREL	81	84	76	80
Fort Collins West	80	82	74	78
South Boulder Creek	76	79	70	75
Welch	79	80	66	75
Rocky Mountain NP	79	74	69	74
Greeley - Weld Tower	80	73	70	74
Welby	77	77	67	73
Aspen Park	77	77	65	73
Fort Collins - CSU	74	74	72	73
Aurora East	74	73	67	71
CAMP	68	67	61	65



**COLORADO**  
Department of Public  
Health & Environment

# Area Designations

- ◉ Non-attainment areas (NAA)
- ◉ Attainment areas (AA)
- ◉ Unclassifiable areas
- ◉ Attainment/maintenance areas

# Area Designations

- ◉ 2008 8-hour ozone (0.75 ppb) classification thresholds
  - Marginal - 0.076 to 0.086
  - Moderate - 0.086 to 0.100
  - Serious - 0.100 to 0.113
  - Severe 0.113 to 0.175
  - Extreme - 0.175 and above

# SIPs

- ◉ SIPs (infrastructure) for NAAQS
  - Enforceable emission limits and other control measures
  - Enforcement of measures
  - Monitor and analyze ambient air quality data
  - Source monitoring
  - Prohibit sources from significantly contributing to nonattainment
  - Adequate personnel, funding, authority
  - Permit fees
  - Government consultation and public notification
  - Revise after NAAQS revisions
- ◉ Regional SIPs
- ◉ Federal Implementation Plans (FIPs)



# Ozone Nonattainment SIPs

		NSR offset ratio	Major source threshold
<b>EXTREME</b> (20 years to attain)	TRAFFIC CONGESTION CONTROLS (if appropriate)	1.5 : 1 Extreme	10
	CLEAN FUELS REQUIREMENT FOR BOILERS		
	PENALTY FEE PROGRAM FOR MAJOR SOURCES		
<b>SEVERE</b> (15/17 years to attain)	LOW VOC REFORMULATED GAS (as appropriate)	1.3 : 1 Severe	25
	VMT GROWTH DEMONSTRATION (& TCMs if needed)		
	VMT DEMONSTRATION (& TCMs if needed)		
<b>SERIOUS</b> (9 years to attain)	NSR REQUIREMENTS FOR EXISTING SOURCE MODS	1.2 : 1 Serious	50
	ENHANCED MONITORING PLAN		
	CLEAN FUELS PROGRAM (if applicable)		
	MODELED DEMO OF ATTAINMENT		
	MILESTONE DEMONSTRATIONS and CONTINGENCY MEASURES FOR RFP		
	3% ANNUAL RFP UNTIL ATTAINMENT		
<b>MODERATE</b> (6 years to attain)	ENHANCED I/M for larger population areas	1.15 : 1 Moderate	100
	CONTINGENCY MEASURES FOR FAILURE TO ATTAIN		
	Stage II Gasoline Vapor Recovery		
	BASIC VEHICLE I/M for larger population areas		
	15% VOC ROP or 15% VOC/NOx RFP (OVER 6 YEARS)		
<b>MARGINAL</b> (3 years to attain)	VOC/NOx RACT for MAJOR/CTG SOURCES	1.1 : 1 Marginal	100
	ATTAINMENT DEMONSTRATION		
	TRANSPORTATION CONFORMITY DEMONSTRATION (MVEBs)		
	NONATTAINMENT NEW SOURCE REVIEW PROGRAM		
	BASELINE EMISSION INVENTORY (EI)		
	PERIODIC EMISSION INVENTORY UPDATES		
	MAJOR SOURCE EMISSION STATEMENTS		

# SIPs

- ◉ EPA review
  - Completeness
  - Approval/disapproval
  - Conditional approval
- ◉ SIP revisions
- ◉ SIP call
- ◉ Sanctions

# Colorado's Ozone SIP

## ◉ Partners

- Regional Air Quality Council (RAQC) - lead agency
- Colorado Department of Public Health and Environment, Air Pollution Control Division (CDPHE/APCD)
- Denver Regional Council of Governments (DRCOG)
- Northern Front Range Metropolitan Planning Organization (NFRMPO)
- Colorado Department of Transportation (CDOT)

## ◉ Colorado Air Quality Control Commission (AQCC)

## ◉ EPA Region 8

# Colorado's Ozone History

## ◉ 1979 1-hour NAAQS

- Primary/secondary 0.12 ppm O<sub>3</sub> - maximum hourly average not to exceed one day per year
- Denver Metro Area (DMA) designated nonattainment
- DMA attained 1988
- EPA classified as “transitional” ozone nonattainment 1991
- EPA approved Colorado ozone maintenance plan 2001 - redesignated to attainment
- Standard revoked 2009



# Colorado's Ozone History

- ◉ 1997 8-hour NAAQS
  - Primary/secondary 0.08 ppm O<sub>3</sub> - annual 4th-highest daily maximum 8-hour, averaged over 3 years
  - Denver Metro North Front Range (DMNFR) designated nonattainment
- ◉ Early Action Compact 2002 - deferred official designation
- ◉ 1997 8-hour designation
  - 2005-2007 monitor data showed nonattainment
  - Designated nonattainment 11/2007
- ◉ 1997 8-hour attainment
  - Attainment demonstration 2009
  - No violations since 2009
  - Standard revoked 2015

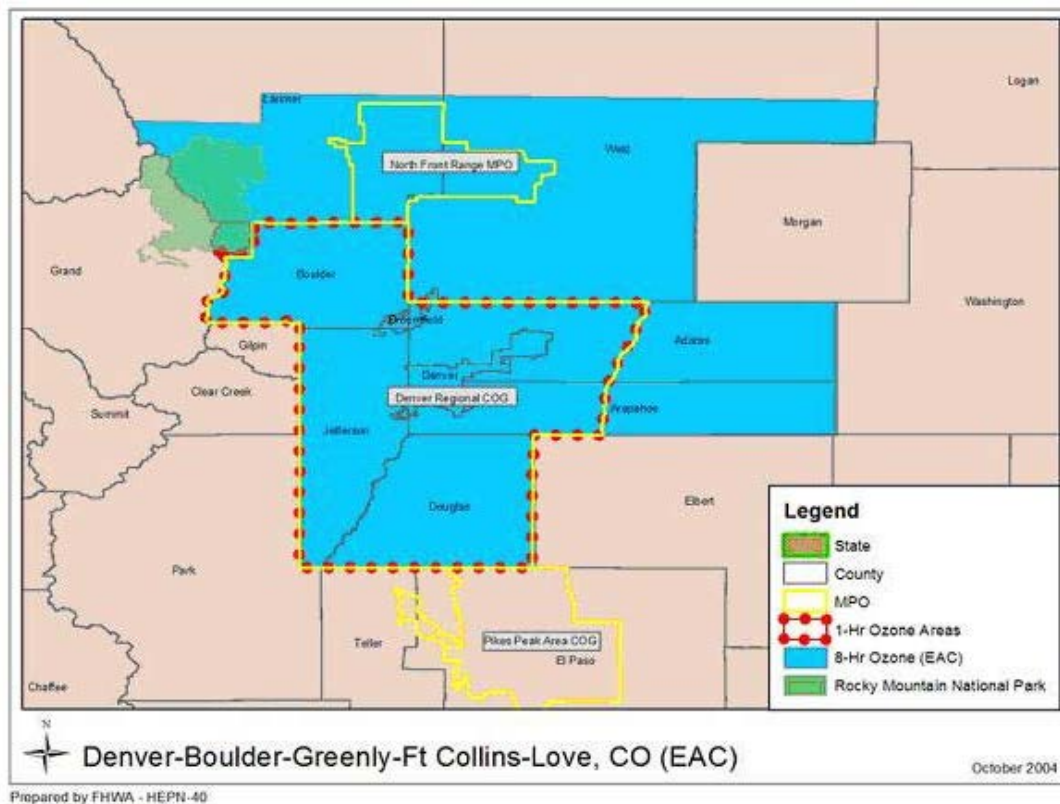
# Colorado's Ozone History

- ◉ 2008 8-hour NAAQS
  - Primary/secondary 0.075 ppm O<sub>3</sub> - annual 4th-highest daily maximum 8-hour, averaged over 3 years
  - DMNFR designated nonattainment
  - 2012-2014 monitor data did not show attainment
- ◉ 2008 8-hour bump-up

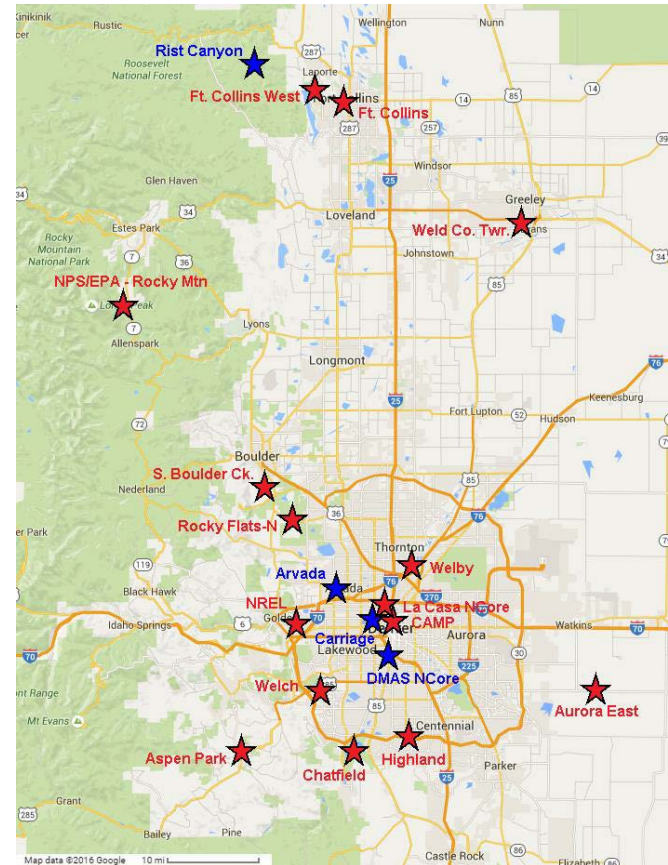
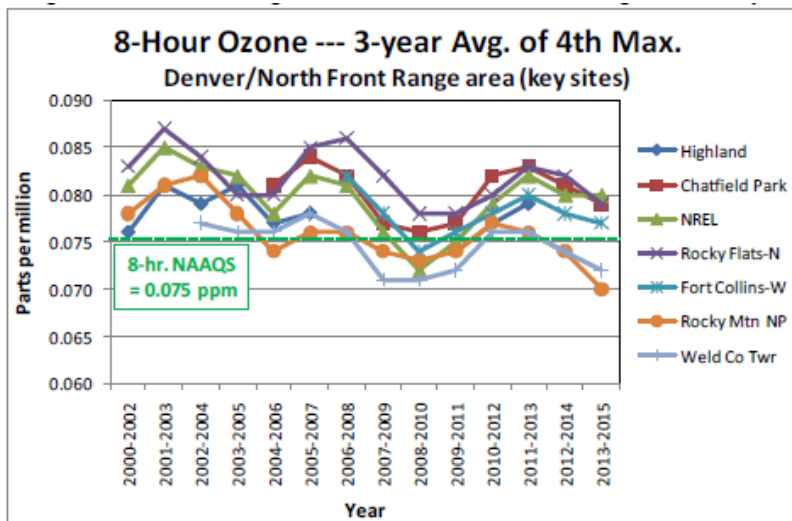
<https://yosemite.epa.gov/R8/R8Sips.nsf/Colorado?OpenView>

# Colorado Designations

- DMNFR Ozone Nonattainment Area



# Colorado Ozone Monitoring





# Ozone Nonattainment SIPs

		NSR offset ratio	Major source threshold
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	MAJOR SOURCE EMISSION STATEMENTS		

# Colorado's 2008 Ozone SIP

- ◉ 2008 8-hour ozone NAAQS
  - Marginal attainment date July 20, 2015
  - Marginal to Moderate nonattainment “bump-up”
    - SIP elements
      - Base (2011) and Future Year (2017) Emissions Inventories
      - Reasonable Further Progress Demonstration
      - Attainment Demonstration and Weight of Evidence Analysis
      - Reasonably Available Control Technology Analysis
      - Reasonably Available Control Measures Analysis
      - Motor Vehicle Inspection and Maintenance Program
      - Nonattainment New Source Review Program
      - Contingency Measures Plan
      - Motor Vehicle Emissions Budgets
  - Moderate attainment date July 20, 2018

# Colorado's Ozone SIP

## ◉ SIP process

- RAQC/APCD
  - ◉ Subcommittees
    - Area Stationary Sources
    - Mobile Sources/Fuels
    - Transportation/Land Use/Pricing/Outreach
  - ◉ Public input
  - ◉ RAQC approval/recommendation
- AQCC rulemaking
- Legislative review
- EPA review

# Colorado's Ozone Future

- ◉ 2008 8-hour ozone - moderate
  - EPA intends to revoke
- ◉ 2015 8-hour NAAQS
  - Designation recommendations (10/2016)
  - EPA designation (10/2017)
  - SIP due - depends on designation (3-4 years)
  - Attainment date - depends on designation (3-20 years)



# Questions?