

ROUTT COUNTY AIR QUALITY REPORT

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Introduction:

This air quality report is provided in support of the strategic initiative for protection of air and water quality. Much of the information comes directly from companion documents; Air Pollution Control Division (APCD) 2015 Air Quality Data Report (AQDR) and the Colorado Air Quality Control Commission Report to the Public. The Air Quality Data Report addresses historical trends in air quality and includes a detailed examination of the monitoring data collected by the APCD in 2015. The Report to the Public discusses the policies and programs designed to improve and protect Colorado's air quality.

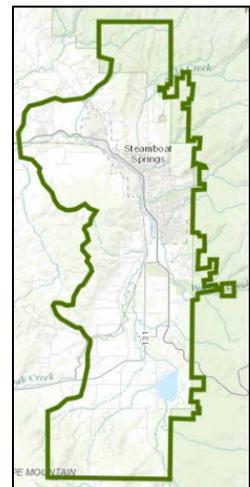
- Annual Data Report: http://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2015AnnualDataReport.pdf
- Annual Report to the Public: https://www.colorado.gov/pacific/sites/default/files/2015-2016_1.pdf

There are many types of air pollution, from blowing dust to human-caused chemical emissions. The U.S. Environmental Protection Agency (EPA) has developed standards for six air pollutants that it calls "criteria pollutants" to protect the public's health and welfare. The standards indicate maximum allowable levels of the regulated pollutants in the air. EPA reviews and revises the standards periodically as necessary as new information on health and environmental effects becomes available. **The six criteria pollutants are particulate matter, ground-level ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead.**

The APCD maintains a statewide monitoring network for all criteria pollutants as required by the federal Clean Air Act and at times conducts special studies of toxic air pollutants. **Monitors are placed in areas where emissions sources and modeling suggest that air quality could be most impacted.** Currently in Routt County the only criteria pollutant that is monitored is for particulate matter less than 10 microns (PM10).

Executive Summary:

- Routt County contains a State designated PM10 Attainment Maintenance Area (See Figure 1)
- PM10 concentrations did not exceed State standards in 2016. Data show highest PM10 occurrences in January but with all measurements below the 24 hour standard of 150 $\mu\text{g m}^{-3}$ (refer to graphs at end of report)
- According to the State there is little need and limited funding sources for monitoring of criteria pollutants in Routt County other than PM10.
 - PM2.5 monitoring in Routt County and other special purpose monitoring sites were discontinued in 2006 due to low concentrations and a lack of funding.
 - There may be value in looking more into potential issues resulting from localized conditions (inversions)
- Identification of potential improvements to County Open Burn Program are in progress



**Figure 1: PM10
Maintenance Area**

- Most improvements center around communication and outreach efforts
- Routt County Environmental Health will work with the City of Steamboat to review solid fuel burning device regulations including enforcement – an issue identified as part of the strategic initiative for air quality
- Reference document locations have been provided that detail State air quality related health concerns from oil and gas activities, air quality monitoring objectives and overviews, oil and gas drilling emissions studies and trends for ozone, and the new BLM Oil and Gas rule.

Regional Air Quality Summary – Central Mountains (including Routt County):

The Central Mountains Region consists of 15 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 about 256,800, according to U.S. Census Bureau 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.

Air Pollution Sources:

- Motor vehicles
- Holcim Portland cement plant in Fremont County
- Sand and gravel operations
- Hayden (Craig) power plant
- Climax Molybdenum Mine
- Oxbow and Mountain Coal mining facilities in Gunnison County
- Wildfires
- Controlled burning.

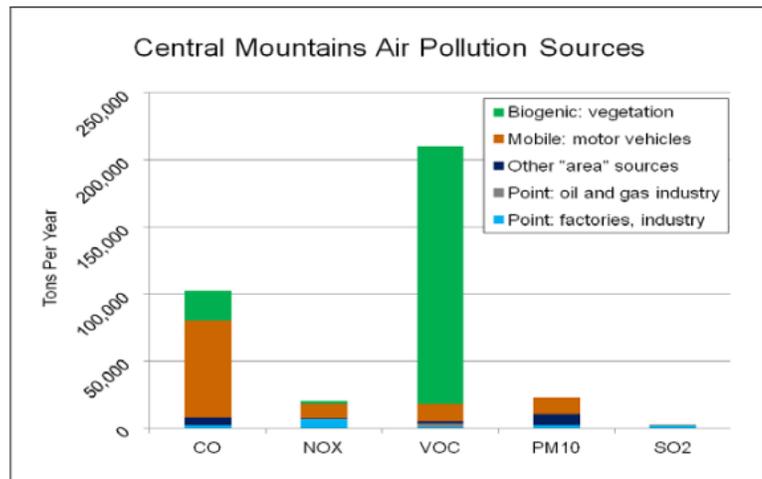


Figure 2: Central Mountains Air Pollution Sources

Air Pollution Control Measures:

- Power plants: dry limestone scrubbers to reduce SO₂ emissions, fabric filter baghouse to control particulate emissions, selective catalytic reduction at the Hayden plant by 2018 to control NO_x emissions, shutdown of the Black Hills Clark Station in 2013, shut down of Unit 1 at the Craig Station in 2020
- Smoke management program for large controlled burns
- Particulate matter control plans for Aspen, Cañon City and Steamboat Springs to control particulate matter through wood-burning controls in each town, street sanding and sweeping controls in Aspen and Steamboat Springs, and traffic reduction measures in Aspen. Any industries located in these cities now or in the future must also comply with emission controls as part of state regulations

Strategic Initiative Detail: Support Protection of Air (and Water) Quality

Goal No. 1: Support Maintenance of Air Quality (and Action Steps)

1. Background on regulatory standards/limits for PM₁₀ and PM_{2.5} (AQDR - Section 2.2.5.3 pg. 22)
2. PM10 monitoring continues with Rick Melzer (Environmental Health Specialist) taking over the primary role of conduction the actual monitoring
3. Results of the monitoring are provided as part of the AQDR (See Figures 2 and 3 at the end of the report)
 - a. **Data show highest PM 10 occurrences in January but with all measurements below the 24 hour standard of 150 µg m-3**
4. Value and Cost of Monitoring for PM_{2.5}
 - a. Monitoring for PM_{2.5} in Colorado began in 1999 with the establishment of sites in Denver, Grand Junction, **Steamboat Springs**, Colorado Springs, Greeley, Fort Collins, Platteville, Boulder, Longmont, and Elbert County. Additional sites were established nearly every month until full implementation of the base network was achieved in July of 1999. In 2004, there were twenty PM_{2.5} monitoring sites in Colorado. Thirteen of the 20 sites were selected based on the population of the metropolitan statistical areas. This is a federal selection criterion that was developed to protect the public health in the highest population centers. In addition, there were seven special-purpose monitoring (SPM) sites. These sites were selected due to historically elevated concentrations of PM₁₀ or because citizens or local governments had concerns about possible high PM_{2.5} concentrations in their communities. **All SPM sites were removed as of December 31, 2006 due to low concentrations and a lack of funding.**
 - b. Although data has only been collected for the past 12 years, the trend in the average levels of PM_{2.5} appears to be essentially flat. Since the standard is based on a three-year average of the highest 98th percentile of samples run, the 24-hour standard has not been violated at any site, nor has the three-year average annual standard of 12 µg m⁻³.
5. Role of Ground-Level Ozone
 - a. Ground level or "bad" ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. 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 VOC. Breathing ozone can trigger a variety of health problems, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma. Ground level ozone can also have harmful effects on sensitive vegetation and ecosystems.
 - b. Generally speaking, sites in the Northern Front Range counties experienced higher concentrations of ozone than other areas (especially sites directly west of, and at higher elevation than, metro Denver), though sites outside the Front Range occasionally have the highest averages. It is important to note that while O₃ concentrations were somewhat lower in 2015 than in previous years (Statewide), there has been an upward trend overall since 2010.

Goal No. 2: Ensure Compliance with National Ambient Air Quality Standards

1. Criteria pollutants are those for which the federal government has established National Ambient Air Quality Standards (NAAQS) in the Federal Clean Air Act and its amendments
2. According to State there is little need and limited funding sources for monitoring of criteria pollutants in Routt County other than PM₁₀.
 - a. Maybe value in looking more into potential issues during inversions
3. Review of local solid fuel burning device regulations in progress
4. County Open Burn Program

- a. R. Melzer tasked with management of Program with goals of ¹⁾ clarifying permitting requirements for State, County, and local Fire Districts, ²⁾ improving communication between public, the communication center, and local fire districts, and ³⁾ streamlining access to permitting information and procedures to the public.

Table 2.1: National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

Pollutant	Primary / Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	Primary	8-hr	9 ppm	Not to be exceeded more than once per year
		1-hr	35 ppm	
Nitrogen Dioxide (NO ₂)	Primary	1-hr	100 ppb	98 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	Annual	53 ppb	Annual mean
Sulfur Dioxide (SO ₂)	Primary	1-hr	75 ppb	99 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hr	0.5 ppm	Not to be exceeded more than once per year
Ozone (O ₃)	Primary and Secondary	8-hr	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
PM ₁₀	Primary and Secondary	24-hr	150 µg m ⁻³	Not to be exceeded more than once per year on average over 3 years
PM _{2.5}	Primary	Annual	12 µg m ⁻³	Annual mean, averaged over 3 years
	Secondary	Annual	15 µg m ⁻³	Annual mean, averaged over 3 years
	Primary and Secondary	24-hr	35 µg m ⁻³	98 th percentile, averaged over 3 years

Figure 3: National Ambient Air Quality Standards (NAAQS) for Criteria Pollutants

Reference Information

Other documents for reference with information related to air quality in Colorado have been placed on the server in the following location: <S:\Enviromental Health\Strategic Initiative Air & Water Quality Protection>.

1. **Responding to Oil and Gas Health Concerns across the State** - Oil and Gas Risk Assessment from Oil and Gas Health Information and Response Program. Result of 2014 Governor’s Oil and Gas Task Force Recommendation to:
 - a. Create a centralized health concern line
 - b. Outfit a mobile air quality monitoring unit
 - c. Create an oil and gas information clearinghouse
 - d. Conduct a human health risk assessment
2. **Air Monitoring Site Placement Overview** - Colorado Department of Public Health and Environment – Air Pollution Control Division
 - a. State air quality monitoring objectives and overview
 - b. Regulatory Requirements
 - c. Ozone trends
3. **Characterizing Air Emissions from Oil and Gas Operations in Garfield County and on the North Front Range** - Colorado State University
 - a. Potential air quality impacts from oil and gas drilling activities

- b. Concentration of study on most active areas of drilling in the State (Weld and Garfield County's)
- c. Does not look at potential "cradle to grave" impacts – just drilling, completions, and production
- d. Final report and study dataset:
 - i. http://www.colorado.gov/airquality/tech_doc_repository.aspx#special_studies
 - ii. <http://www.garfield-county.com/air-quality/air-emissions-study.aspx>

- 4. *BLM Press Release: New Oil and Gas Rule*
- 5. *Methane Waste Prevention Rule Fact Sheet*
- 6. *Washington Post article on new oils and gas rule*

Selected Information from Annual Air Quality Data Report (2015)

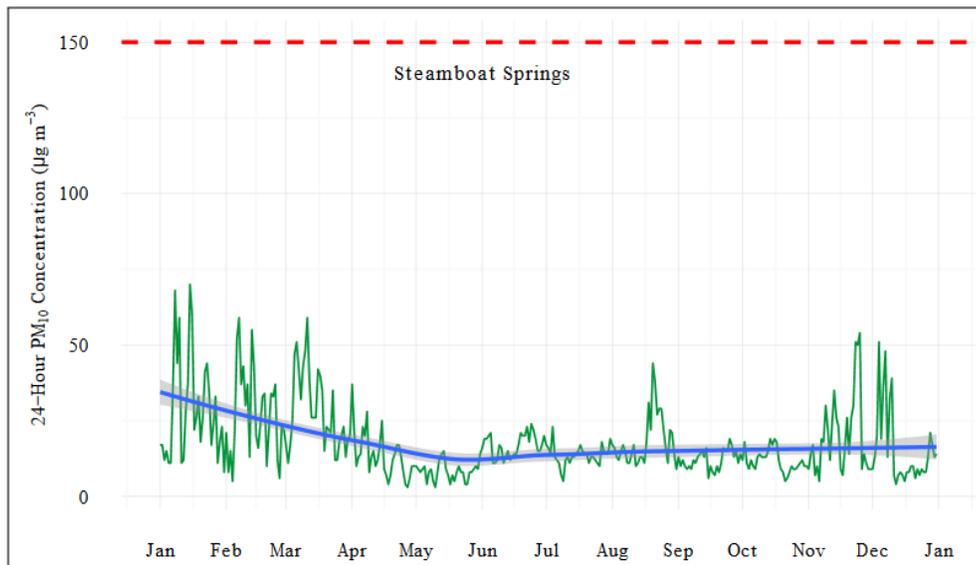


Figure 5.58: 24-hour average PM₁₀ concentrations at the Steamboat Springs station. The mean trend obtained using a generalized additive model is shown as a blue line. The 24-hour standard (150 µg m⁻³) is shown as a dashed red line.

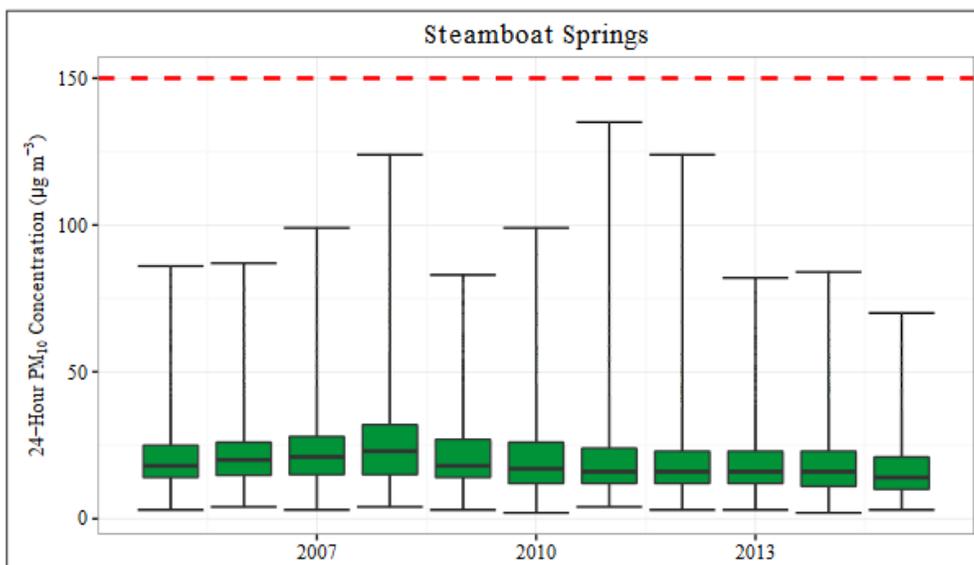


Figure 4.4: 24-hr PM₁₀ concentrations at the Steamboat Springs station. The 24-hour standard (150 µg m⁻³) is shown as a dashed red line.