

# Report to the Public 2014-2015



**COLORADO**

**Air Quality Control Commission**

Department of Public Health & Environment



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## Message from the Chairman . . .

The Air Quality Control Commission appreciates all that have taken the time to provide their perspectives on air quality issues in Colorado. The commission would like to thank everyone that appeared at our public meetings, submitted written comments, or who simply monitored our meetings via the webcast. I invite you to explore this Annual Report to the Public.

This past year has been a busy one. The commission:

- Approved a consensus proposal to further reduce nitrogen oxide emissions from the Craig Power Station in northwest Colorado. These emission reductions are designed to further improve visibility resources in national parks and wilderness areas.
- Toured the Craig Power Station and the nearby Trapper coal mine to gain a better understanding of these industrial operations and the pollution control techniques employed at these facilities.
- Held an evening meeting in Craig to solicit public comments on air quality issues in northwestern Colorado.
- Continued to discuss and learn about climate change and greenhouse gases issues in preparation for future rulemaking decisions anticipated for 2016.
- Monitored the implementation of hydrocarbon emission reductions required by recently adopted rules for the oil and gas industry.

This coming year will be important as the commission will be considering:

- A comprehensive Clean Power Plan.
- New federal regulations for oil and gas operations.
- Additional regulations needed to address the existing ozone standard.
- The implementation of new, more stringent ozone standard.
- Designation recommendations for ambient air quality standards.

Each of these issues requires public and private participation to finalize plans to meet the goals for Colorado. I would like to personally invite each interested person to join in the public meeting process needed for each issue. By participating as a stakeholder providing your comments, or submitting written comments directly to the commission, we can work together to develop thoughtful plans for Colorado.

The commission is composed of nine Governor-appointed volunteers with diverse backgrounds and experiences. We are fortunate to have six members outside the Denver-metro area, bringing to the commission perspectives from across the state. Commissioners rely on the hard work of Air Pollution Control Division and commission staff to help make informed decisions.

*John Clouse*

# Major air pollutants

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.

In addition to criteria pollutants, another class of regulated air pollutants is "toxic air pollutants." Toxic air pollutants, also known as hazardous air pollutants, are those that are known or suspected to cause cancer or other serious health or environmental effects.

Greenhouse gases, such as carbon dioxide and methane, are pollutants that contribute to changes in our climatic environment. Climate change has been a growing concern in recent years, and Colorado and the nation are undertaking steps to reduce greenhouse gas emissions and their impacts.

## Monitoring the Pollutants

The Colorado Air Pollution Control Division 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.

The following links provide more detail about certain criteria pollutants of concern in Colorado. For more details on all the criteria pollutants and Colorado air monitoring sites and data, see our [monitoring and data website](#), or the annual [Colorado Air Quality Data Report](#).

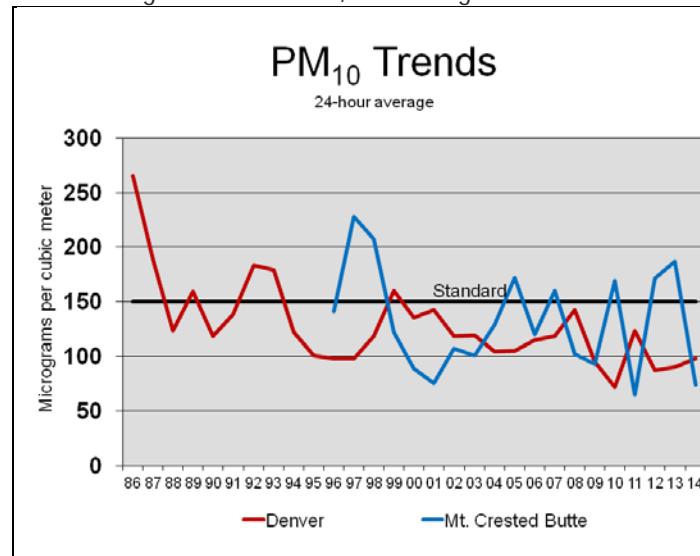
- [Particulate matter](#).
- [Ground-level ozone](#).
- [Nitrogen oxides](#).
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- [Greenhouse gases](#).
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## Major air pollutants - particulate matter

Particulate matter is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Small particles less than 10 microns in diameter (PM<sub>10</sub>) pose the greatest concern to human health. A micron is 1 millionth of a meter. A human hair is about 60-70 microns in diameter.

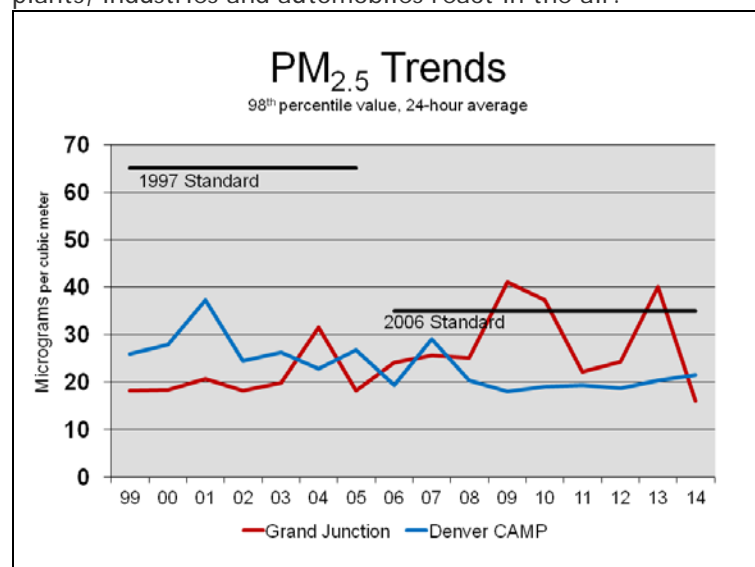
### PM<sub>10</sub>

PM<sub>10</sub> consists of solid and semisolid material up to 10 microns in size suspended in the atmosphere. The majority of PM<sub>10</sub>, about 78 percent, are from fugitive dust sources rather than stack emissions or internal engine combustion, according to the EPA's national emissions inventory.



### PM<sub>2.5</sub>

PM<sub>2.5</sub> particles are a subset of PM<sub>10</sub> and include those particles up to 2.5 microns in size. PM<sub>2.5</sub> can be directly emitted from sources such as wildfires, or they can form when gases emitted from power plants, industries and automobiles react in the air.



## Health and Environmental Effects

Particulate matter can enter the lungs. Once inhaled, PM<sub>10</sub> and PM<sub>2.5</sub> particles can affect the heart and lungs and cause serious health effects, including respiratory problems, cancer and premature mortality. The environmental effects range from visibility degradation to climate change and vegetation damage.

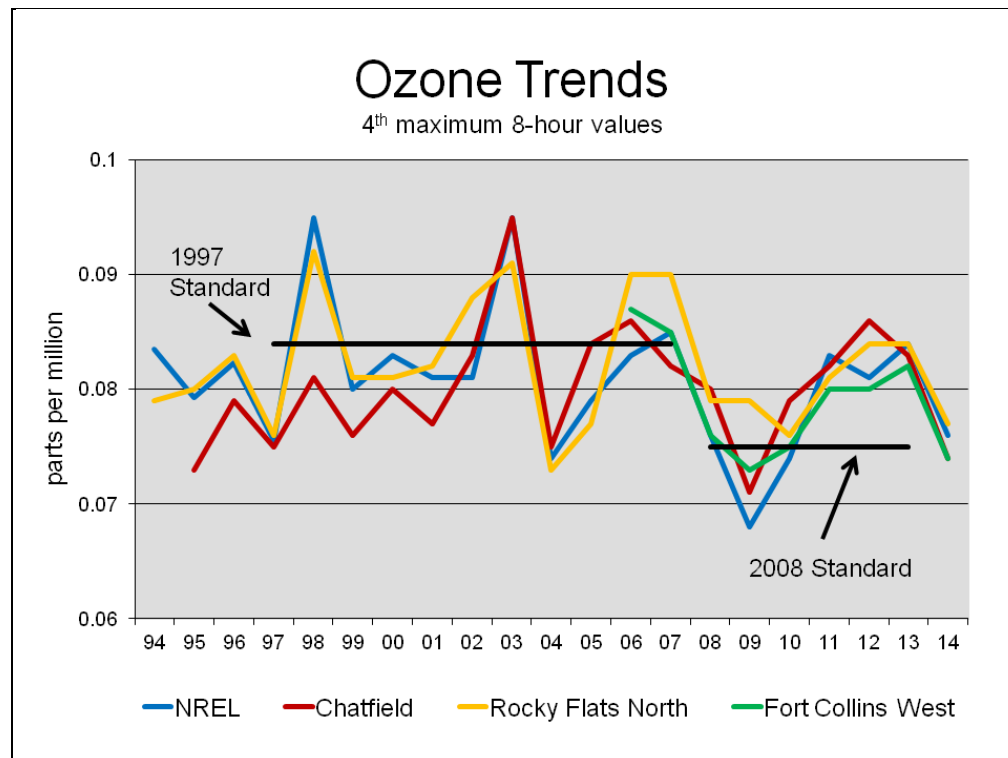
## Impacts in Colorado

All monitoring sites in Colorado meet the federal standards for both PM<sub>10</sub> and PM<sub>2.5</sub> pollution. However, particle pollution at times can cause temporary, localized air quality impacts due to blowing dust or wildfires.

The charts on these pages show exceedances of particulate standards in recent years. These exceedances were caused either by winter temperature inversions that trap pollutants close to the ground or high winds that resulted in blowing dust. These exceedances do not count as violations because the standards are based on 3-year averages, and those averages are below the standards in these locations.

## Major air pollutants - ground-level ozone

Ozone is formed through complex photochemistry involving volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. Ozone typically is not emitted directly from an individual source. Emissions from motor vehicles, industry, oil and gas production, and even vegetation contribute to ozone formation.





Ozone is colorless and odorless at ambient concentrations. In the upper stratosphere, naturally occurring ozone helps protect the earth from ultraviolet radiation.

The highest ground-level ozone concentrations usually occur in the summer when hot, still days cause reactive pollutants to form ozone. However, high ozone events have been observed in some rural areas in winter where oil and gas production activities are concentrated.

## Health and Environmental Effects

Ozone can cause breathing difficulties and respiratory infections in the elderly, the young and those with pre-existing ailments such as asthma, and can cause premature mortality. Even healthy people who exercise or work outdoors can experience respiratory effects from ozone. Ground-level ozone also can have detrimental effects on plants and ecosystems.

## Impacts in Colorado

The Denver-metropolitan and North Front Range areas have a history of violating the national ozone standards. The area was designated by the U.S. EPA as a marginal “nonattainment area” for ozone in 2012, and is expected to be bumped up to a moderate nonattainment area by January of 2016. These nonattainment designations mean that ozone levels exceed the 2008 federal standard of 75 parts per billion, averaged over three years.

A revised State Implementation Plan (SIP) to reduce ozone levels is under development by the Air Pollution Control Division and the Regional Air Quality Council. The plan will include detailed technical analysis of the formation of ozone, future trends in ozone levels, and strategies to reduce ozone. Colorado must comply with the ozone standard by 2018, and the SIP will include the measures necessary to meet the deadline. The Air Quality Control Commission is providing input and will consider adoption of the plan in late 2016. The rest of Colorado presently attains the ozone standard.

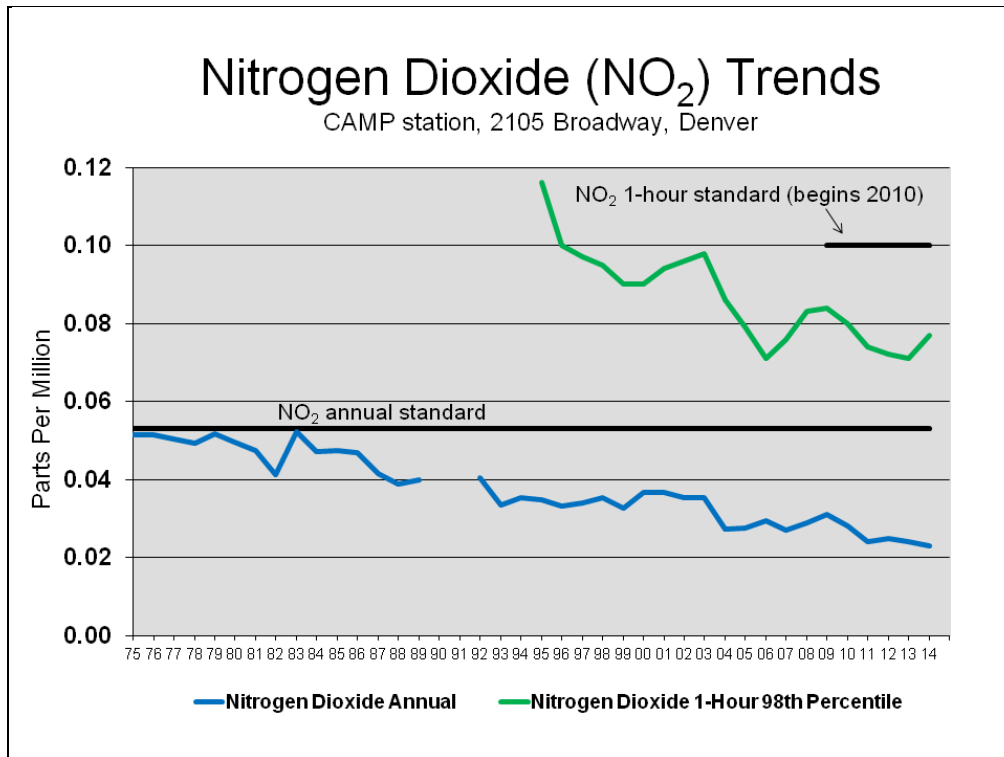
The commission has already taken regulatory actions to reduce ozone. In early 2014 the commission adopted regulatory changes to significantly reduce VOC emissions from the oil and gas production sector. When fully implemented, the regulatory revisions will reduce VOC emissions by 93,000 tons per year in Colorado. In addition, the commission approved a regional haze plan in 2011 that includes substantial oxides of nitrogen (NOx) emission reductions that will improve ozone throughout the state. More than 35,000 tons per year of NOx reductions throughout Colorado will occur by the year 2018 through these actions. In addition, new federal motor vehicle emissions standards and Colorado's motor vehicle inspection and maintenance programs also help reduce precursors of ozone.

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## Major air pollutants - nitrogen oxides

Nitrogen oxides (NO<sub>x</sub>) comprise a group of highly reactive gases that contain nitrogen and oxygen in varying amounts. NO<sub>x</sub> play a major role in the formation of ozone, particulate matter, haze and acid rain. NO<sub>x</sub> is an “ozone precursor.”

The majority of NO<sub>x</sub> is nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO). NO<sub>2</sub> is a reddish brown, highly reactive gas that is formed in the ambient air through the oxidation of NO.



The major sources of man-made NO<sub>x</sub> emissions are high-temperature combustion processes such as those in automobiles, industrial engines and power plants. Home heaters and gas stoves can also produce substantial amounts of NO<sub>x</sub> in indoor settings.

### Health and Environmental Effects

NO<sub>x</sub> reacts in the air to form ground-level ozone and fine particle pollution, which are associated with adverse health effects. NO<sub>x</sub> can increase respiratory problems, cause symptomatic effects in asthmatic individuals and increase susceptibility to respiratory infections.

NO<sub>x</sub> contributes to a wide range of environmental effects directly and, when combined with other precursors, to acid rain and ozone. Increased nitrogen in terrestrial and wetland systems can lead to changes in plant species composition and diversity. Nitrogen in lakes and streams can lead to eutrophication (a condition of excessive algae growth), and leads to a severe depletion of dissolved oxygen and increased levels of toxins harmful to aquatic life. NO<sub>x</sub> can also contribute to visibility impairment.



## Impacts in Colorado

The state monitors NO<sub>2</sub> at four sites in Colorado: downtown Denver's CAMP station; Welby just north of Denver; just south of downtown Denver near Interstate 25; and in north Denver near Pecos Street and Interstate 70. All sites show NO<sub>2</sub> values that are well below the national ambient air quality standards.

Nationally, average NO<sub>2</sub> concentrations are well below the National Ambient Air Quality Standards and currently are at the lowest levels recorded in the past 20 years. The federal land managers also monitor NO<sub>2</sub> in Colorado and report their data to the EPA's Air Quality System data base. These monitors also show levels below the NO<sub>2</sub> standard.

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## Major air pollutants - lead

Lead is a metal found naturally in the environment as well as in manufactured products. The primary historical sources of lead air emissions have been from motor vehicles burning leaded gasoline, and certain industrial sources. Since the phase-out of leaded gasoline beginning in the 1970s, today's primary sources of lead air emissions are industrial metal processing, lead smelting and aviation gasoline.

In 2008 the EPA revised the national standard for lead from 1.5 micrograms per cubic meter to .15 micrograms per cubic meter. There is one lead monitor in Colorado at the La Casa site near Pecos Street and Interstate 70 in north Denver. The monitor shows lead levels well below the standard.

### Health and Environmental Effects

Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. Lead exposure leads to neurological effects in children and cardiovascular effects such as high blood pressure in adults. Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems and learning deficits.

Ecosystems near point sources of lead have demonstrated a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

## Impacts in Colorado

Since the phase-out of leaded gasoline, lead levels monitored in Denver have decreased by more than 95 percent. Lead at the Denver monitoring site is now at or near the minimum levels of detection. A lead monitor was added at Centennial Airport in Arapahoe County in 2010 to meet new federal lead monitoring requirements at airports. Aviation fuel still contains lead. The monitor was removed in 2014 after showing minimum levels of detection.

## Major air pollutants - hazardous air pollutants

Hazardous air pollutants, also known as toxic air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects. Examples include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

While no ambient air quality standards have been set for air toxics, the EPA has published a list of 188 air toxics and has developed standards for specific industries. These standards are called the National Emission Standards for Hazardous Air Pollutants, or NESHAPS. NESHAPS are commonly addressed through maximum achievable control technology (MACT) requirements. MACT requirements are technology-based controls or practices for specific industries and are designed to reduce hazardous air pollutant emissions to a maximum achievable degree, taking into consideration the cost of reductions and other factors.

After the EPA adopts a MACT standard at the federal level, the same standard is proposed for adoption at the state level by the Air Quality Control Commission.

Air toxics also are reduced through automobile inspection and maintenance, ozone reduction measures to reduce volatile organic chemicals, the Mercury-free Colorado Campaign, a diesel school bus emissions control retrofit program, and pollution prevention in industries and communities statewide.

### Health and Environmental Effects

People that experience prolonged exposure to toxic air pollutants at significant concentrations may have an increased chance of experiencing serious health effects. These health effects can include cancer, damage to the immune system, as well as neurological, reproductive, developmental, respiratory and other health problems. Some toxic air pollutants such as mercury can deposit onto soils or surface waters, where they are taken up by plants and ingested by animals, and eventually accumulated up through the food chain. Like humans, animals may experience health problems if exposed to sufficient quantities of air toxics over time.

### Impacts in Colorado

In general, studies have shown that air toxics levels are similar in urbanized areas across the nation. People are exposed to air toxics primarily through transportation, as motorists or passengers, or as residents who live near major highways or industries. Several air monitoring studies of air toxics in Colorado have been done, including in Denver, Grand Junction, Pueblo and Garfield County. In general, the studies have found that most air toxics levels are low. Urban areas where motor vehicles and industries are concentrated have the highest impacts in Colorado as well as rural areas where oil and gas development occurs.

For more information:

- [EPA National monitoring programs annual reports.](#)
- [CDPHE air toxics reports.](#)
- [Garfield County reports.](#)

## Major air pollutants - greenhouse gases

Both natural and human emissions of greenhouse gases (GHGs) absorb the sun's heat and trap that heat in the atmosphere. As atmospheric concentrations of these gases increase, the Earth's climate is impacted. Actions taken by the Air Quality Control Commission have helped to reduce GHG emissions. The Regional Haze state implementation plan, for example, incorporates significant reductions in GHG emissions from electrical generating units due to power plant retirement and/or repowering with natural gas. Also, the Air Quality Control Commission's February 2014 oil and gas rulemaking will reduce methane emissions from that sector.

The Air Pollution Control Division developed a Greenhouse Gas Inventory for the State of Colorado. The inventory shows data from all sectors in Colorado based on EPA's State Inventory Tool (SIT) Model. The inventory is available on the division's website at: [Colorado greenhouse gas reports](#).

Nationally, carbon dioxide makes up about 84 percent of greenhouse gases, methane makes up 9 percent, with nitrous oxide and fluorinated gases making up the rest, according to the U.S. Environmental Protection Agency.

The data from the most recent inventory shows that the largest source of greenhouse gas emissions from human activities in Colorado is from burning fossil fuels for electricity and transportation. Other categories of greenhouse gas emissions in Colorado include industrial processes (such as the production of cement and steel), agriculture, forestry, oil and gas exploration and development, coal mining, other land use, and waste management including landfills.

### Environmental Effects

Temperatures are rising, snow and rainfall patterns are shifting, and more extreme climate events are affecting the environment, according to the EPA. Glaciers, snowpack and sea ice are shrinking, oceans are rising, and droughts are longer and more intense in some areas. [EPA Climate Change Basics website](#).

### Impacts in Colorado

A number of observed and projected climatic changes have been cited in Colorado and the Southwest by the EPA. [EPA Climate Change in the Southwest](#).

These changes include:

- Increasing temperatures and more frequent and severe droughts will likely worsen existing competition for water resources.
- Drought, wildfire, changes in species' geographic ranges, invasive species and pests will likely threaten native Southwest forests and ecosystems.
- Climate change may make it difficult for the Southwest's growing cities to attain air quality standards and meet energy and water demands.
- Climate change poses threats to the region's native peoples, infrastructure, agriculture, and recreational activities.

For additional information on the impacts of climate change in Colorado, see the Colorado Water Conservation Board's [Climate Change in Colorado report](#).

New state and federal regulations require sources to report their GHG emissions. Federal greenhouse gas permitting requirements were established in 2011. Under Colorado's permitting program, sources may need to limit their emissions of GHG or utilize emissions control equipment known as Best Available Control Technology.

Other regulations that help prevent greenhouse gas emissions include the federal motor vehicle emissions and fuel mileage standards, and the oil and gas regulations adopted in February 2014 by the Air Quality Control Commission that will reduce emissions of methane.

Colorado is also developing a carbon pollution reduction plan to comply with the federal Clean Power Plan that calls for significant reductions in carbon dioxide emissions from coal-fired power plants. The commission will begin reviewing the plan in 2016. See Colorado's [Clean Power Plan website](#).

Colorado participates in a number of non-regulatory initiatives to reduce GHGs, including collaboration with the Colorado Energy Office (CEO)'s Greening Government Initiative to report and reduce energy use. Additionally CDPHE coordinates with CEO and the Colorado Water Conservation Board on climate issues as part of HB 13-1293.

A standing workgroup of the commission is investigating greenhouse gas reduction strategies for Colorado and analyzing options for incorporating climate change policies into rules. Information on activities can be found on the [commission's home page](#).

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## Major air pollutants - regional haze

Regional haze is a term for the veil of white or brown haze that obstructs vistas in many parts of the country, including areas of Colorado. The haze is caused by fine particles including sulfates, carbon, soil particles, ammonium and nitrates. These particles are produced by emissions from power plants, industrial sources, motor vehicles, fires, agricultural activities, and windblown dust and dirt. The particles are carried by the wind, sometimes for hundreds or even thousands of miles in the case of transcontinental transport of pollutants.

### Health and Environmental Effects

In our nation's scenic areas, the visual range has been reduced substantially by air pollution. In the West, visual range has decreased from an average of 140 miles to 35-90, according to the EPA.

Some of the pollutants which form haze also have been linked to serious health problems and environmental damage. Exposure to very small particles in the air has been linked with respiratory illness, decreased lung function, and even premature death. In addition, particles such as nitrates and sulfates contribute to acid rain formation, and in Colorado has led to nitrogen deposition and over-fertilization of alpine ecosystems in Rocky Mountain National Park.

## Impacts in Colorado

The federal Regional Haze Rule focuses on National Parks and Wilderness (Class I) Areas. Under the Clean Air Act, the "Class I" area designations were given to 158 areas in existence as of August 1977 that included national parks greater than 6,000 acres and all national wilderness areas and memorial parks greater than 5,000 acres. Colorado has 12 Class I areas. Haze reduction in these areas will have the complementary effect of improving visibility and air quality throughout Colorado, including reducing nitrogen deposition at Rocky Mountain National Park. Nitrogen deposition has impacted the park, including changes in the type and abundance of aquatic plant species, elevated levels of nitrate in surface waters, elevated levels of nitrogen in spruce tree chemistry, long-term accumulation of nitrogen in forest soils and a shift in alpine tundra plant communities favoring sedges and grasses over the natural wildflower flora.

The Colorado Air Quality Control Commission adopted a Regional Haze State Implementation Plan in January 2011. The EPA approved this plan in October 2012. The process included a detailed analysis of regional haze and its sources, and established emissions controls for major industrial sources of haze.

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## Major air pollutants - more information

### [Air quality home page.](#)

Statewide monitoring data, current air quality, forecasted air quality.

### [Ozone.](#)

Current status of ozone levels, health effects, nonattainment status and ozone reduction efforts.

### [Greenhouse gas/climate change.](#)

Information on Colorado's greenhouse gas regulations, EPA rules, and Colorado's greenhouse gas inventory.

### [Regional Haze.](#)

Colorado's federally-approved Regional Haze Plan, which show status of regional haze, sources, and strategies that will reduce regional haze.

### [Nitrogen deposition at Rocky Mountain National Park.](#)

Current status on nitrogen deposition and its impacts at the park, including the planning documents that specify the reduction strategies in place.

### [Pollutant standards and health effects.](#)

Federal and state air quality standards, health effects, areas affected in Colorado, control strategies.

# Major initiatives

## Major initiatives include:

- [Ozone reduction.](#)
- [Oil and gas emissions.](#)
- [Clean Power Plan.](#)

### Ozone reduction

The Denver and north Front Range area is in the midst of a multi-year effort to reduce ground-level ozone levels to comply with federal air quality standards. The area was designated by the U.S. EPA as a marginal “nonattainment area” for ozone in 2012, and is expected to be bumped up to a moderate nonattainment area by January of 2016. These nonattainment designations mean that ozone levels exceed the 2008 federal standard of 75 parts per billion, averaged over three years.

A revised State Implementation Plan (SIP) to reduce ozone levels is under development by the Air Pollution Control Division and the Regional Air Quality Council. The plan will include detailed technical analysis of the formation of ozone, future trends in ozone levels, and strategies to reduce ozone. Colorado must comply with the ozone standard by 2018, and the SIP will include the measures necessary to meet the deadline. The Air Quality Control Commission is providing input and will consider adoption of the plan in late 2016.

The commission has already initiated a number of regulatory efforts to reduce ozone levels. Most recently, the commission in 2014 adopted requirements to reduce hydrocarbon emissions from the oil and gas production sector that lead to ozone formation. The groundbreaking requirements will dramatically reduce hydrocarbon emissions from the sector, and are the first set of reduction strategies in the nation aimed at methane. These regulations are also part of Colorado’s broader effort to reduce greenhouse gas emissions that lead to climate change.

### Oil and gas emissions

After adopting new regulatory requirements in 2014 to reduce oil and gas emissions from “upstream” production facilities, the commission requested an analysis of potential additional reductions of hydrocarbons from natural gas compressor engines and from pneumatic control devices at both well production facilities and “downstream” natural gas distribution facilities. The resulting analysis was presented to the commission in March 2015. The commission will continue to investigate this area, including reviewing the impact of new federal rules, and will consider whether further cost effective opportunities exist for emissions reductions from pneumatics and compressors. The commission will monitor these federal efforts and continue to collaborate with stakeholders and the APCD to find opportunities for further reductions of hydrocarbon emissions.

### Clean Power Plan

The U.S. EPA in August 2015 finalized new rules designed to reduce carbon emissions from coal-fired power plants across the country. Known collectively as the Clean Power Plan, the rules are designed to reduce carbon emissions and protect public health and the environment while maintaining an affordable, reliable energy system. The Clean Power Plan includes new source performance standards and emission guidelines for both new and existing electric generating units. Colorado has already taken a number of regulatory initiatives to reduce carbon pollution, including retiring or repowering coal-fired units, increasing renewable energy use and energy efficiency, and reducing energy demand. The state and the commission will develop a plan that meets Colorado’s needs.



Carbon dioxide (CO<sub>2</sub>) is a greenhouse gas that contributes to climate change. Coal-fired power plants are estimated to account for as much as 40 percent of carbon dioxide emissions nationwide. The new federal rules call for a significant reduction of CO<sub>2</sub> emissions by 2030.

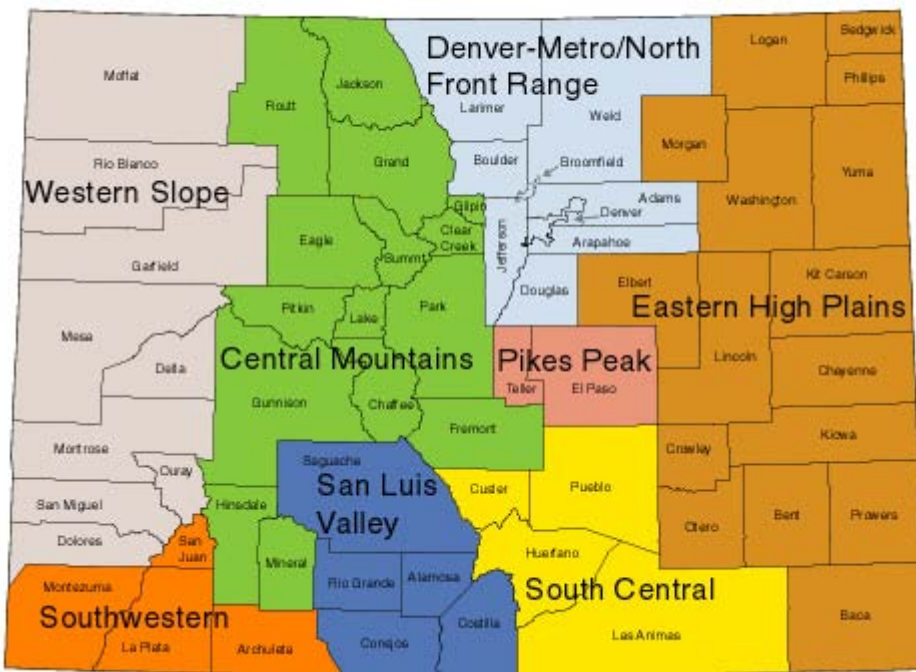
Colorado will develop a response to the Clean Power Plan through a public process. The process will include opportunities for input from diverse stakeholders across Colorado. The commission expects to review and rule on Colorado carbon reduction plans over the next couple of years.

For more information see Colorado's [Clean Power Plan website](#).

## Regional air quality

Areas of the state differ greatly from one another in landscape, weather, population, motor vehicle traffic, amount of industry and potential of wood smoke from residential fires, wildfires and controlled burns. This section of the report separates Colorado into eight regions to more clearly address each region's specific air quality conditions and activities.

### State Air Quality Planning Regions



- [Denver-Metro/North Front Range Region](#).
- [Eastern High Plains Region](#).
- [South Central Region](#).
- [Pikes Peak Region](#).
- [San Luis Valley Region](#).
- [Southwest Region](#).
- [Western Slope Region](#).
- [Central Mountains Region](#).

## Regional air quality - Denver-Metro/North Front Range

The Denver-Metro/North Front Range Region includes Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer and Weld counties. It includes the largest population area of the state, with 2.8 million people living in the seven-county Denver-metro area and another half-million living in the northern Colorado area of Larimer and Weld counties. This area includes Rocky Mountain National Park and several wilderness areas.

In 2002 the area came into compliance with all federal air quality standards.

The region presently complies with all National Ambient Air Quality Standards, except for ozone. The area has been exceeding the EPA's most recent ozone standards since the early 2000s, and in 2007 was formally designated as a "nonattainment" area. This designation was re-affirmed in 2012 when the EPA designated the region as a "marginal" nonattainment area for the more stringent ozone standard adopted by EPA in 2008.

Rocky Mountain National Park has been impacted by nitrogen deposition, which is causing changes to the alpine plant and aquatic environments. A nitrogen reduction plan has been developed by a team of state and federal agency scientists. For more information on this groundbreaking initiative see the [Rocky Mountain National Park Initiative website](#).

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 Air Quality Control Commission and the Air Pollution Control Division developed, adopted and implemented air quality improvement plans to reduce each of the pollutants.

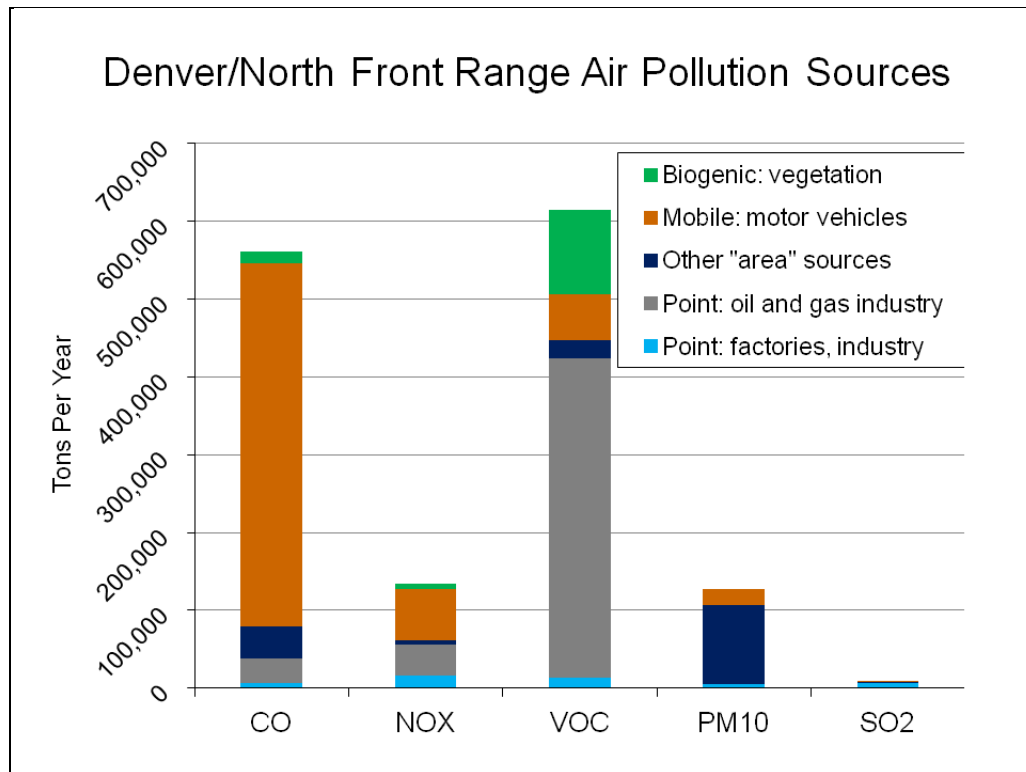
Fort Collins, Longmont and Greeley were nonattainment areas for carbon monoxide in the 1980s and early 1990s, but have met the federal standards since 1995. Air quality improvement plans have been implemented for each of these communities.

### Air Pollution Sources

- Motor vehicles.
- Road dust.
- Oil and gas production.
- Large commercial breweries.
- Petroleum refining.
- Asphalt production.
- Cement manufacturing.
- Sand and gravel operations.
- Glass bottle manufacturing.
- Commercial seating manufacturing.
- Area-wide remediation at Rocky Mountain Arsenal.
- Coal and natural gas power plants.

## Air Pollution Control Measures

- Automobile emissions inspection and maintenance program.
- Street sweeping.
- Controls on oil and gas production tanks, equipment and engines.
- Permitting program limiting emissions from industrial sources.
- Lime spray dryers to reduce sulfur oxide emissions from power plants.
- Baghouses to reduce particulate matter emissions from power plants.
- Non-selective catalytic reduction to reduce NOx at cement plants.
- At power plants, low NOx burners, fuel switching to natural gas, and unit shutdowns.



## Regional air quality - Eastern High Plains

The Eastern High Plains region makes up 40 percent of Colorado's land area and encompasses the counties on the plains of eastern Colorado. The area is semi-arid and often windy. The area's population is approximately 157,000 according to U.S. Census Bureau estimates.

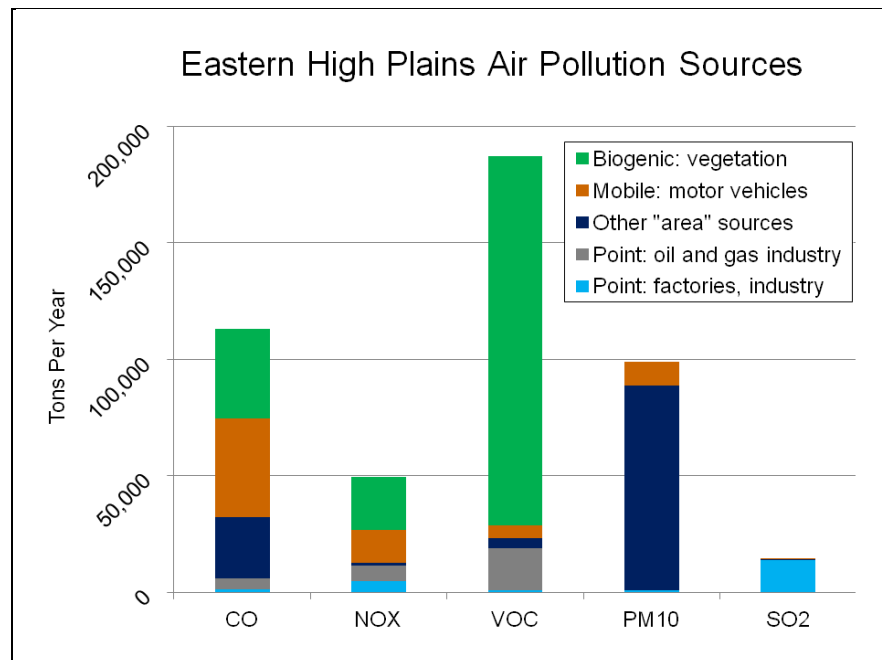
Its major urban centers have developed around farming, ranching and trade centers such as Sterling, Fort Morgan, Limon, La Junta and Lamar. The agricultural base includes both irrigated and dryland farming. All of the area complies with federal air quality standards.

## Air Pollution Sources

- Motor vehicles.
- Windblown dust.
- Odors from confined animal feeding operations.
- Oil and gas production.
- Pawnee Power Plant near Brush.
- Western Sugar beet sugar processing in Fort Morgan.
- Cargill Meat packing plant in Fort Morgan.
- Lamar Power Plant.

## Air Pollution Control Measures

- Lamar Natural Events Action Plan for windblown dust mitigation, which includes elements such as:
  - Blowing dust advisories and forecasting.
  - Public outreach on dust mitigation.
  - Dust control measures, such as street sweeping, curtailing construction activities that disturb soil, applying water to disturbed soils, planting vegetation and wind breaks, reducing or postponing tilling and plowing.
- State odor control regulation for hog farms.
- Statewide oil and gas emission controls.
- Scrubbers, baghouses, dust collectors and area dust suppression at Western Sugar.
- Lime spray dryer, low NOx burners, and selective catalytic reduction at Pawnee Power Plant.
- Low NOx burners, packed scrubber and flare device, along with other permit conditions to limit emissions at the Cargill meat packing plant.
- Baghouse to control particulate matter and limestone combustion injection to control sulfur dioxide at Lamar Power Plant.



## Regional air quality - South Central

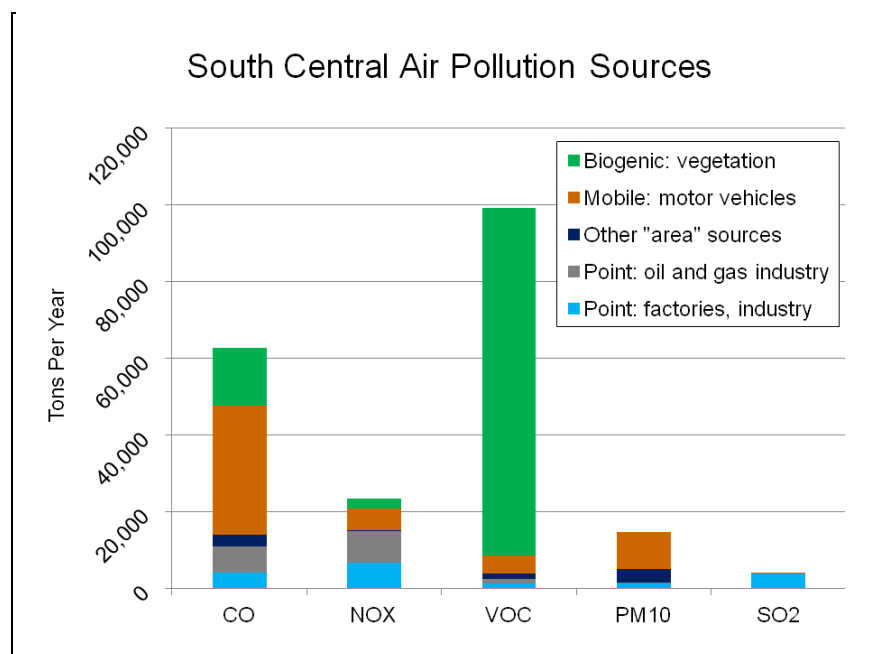
The South Central Region is comprised of Pueblo, Huerfano, Las Animas and Custer counties. Its population is approximately 184,800 according to U.S. Census Bureau estimates. Urban centers include Pueblo, Trinidad and Walsenburg. The region has rolling semiarid plains to the east and is mountainous to the west. All of the area complies with federal air quality standards.

### Air Pollution Sources

- Motor vehicles.
- Fugitive dust.
- The Comanche Power Plant near Pueblo.
- Evraz Rocky Mountain Steel Mills in Pueblo.
- GCC Rio Grande Cement Plant in Pueblo.
- Oil and gas production.
- Large natural gas compressor stations in Las Animas County.

### Air Pollution Control Measures

- Local dust control plans.
- Selective catalytic reduction, low NOx burners, lime spray dryers and activated carbon mercury controls at Comanche Power Plant to reduce NOx, SO2 and mercury emissions.
- Compliance actions, monitoring and mercury reduction program at Evraz Rocky Mountain Steel Mills.
- Statewide oil and gas emission controls.
- VOC controls on natural gas compressor stations.



## Regional air quality - Pikes Peak

The Pikes Peak Region includes El Paso and Teller counties. The area has a population of approximately 626,200 according to 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.

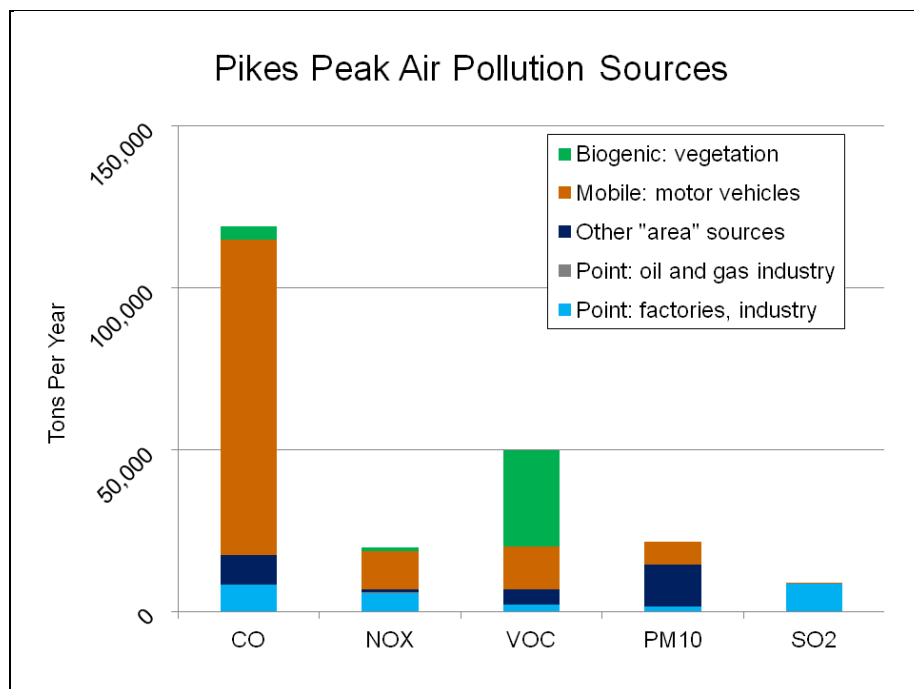
### Air Pollution Sources

As in other urbanized areas in Colorado, pollutants in the Pikes Peak Region originate primarily from stationary and mobile sources.

- Motor vehicles.
- Road dust.
- Area dust from construction activities.
- The Drake and Nixon power plants and Fountain Valley Electric Generating Station.
- Oil and gas production.
- Sand and gravel operations.

### Air Pollution Control Measures

- Street sweeping.
- Dust control plans.
- Lime spray dryers and low NOx burners at power plants to control NOx and SO2 emissions.
- Statewide oil and gas emission controls.





## Regional air quality - San Luis Valley

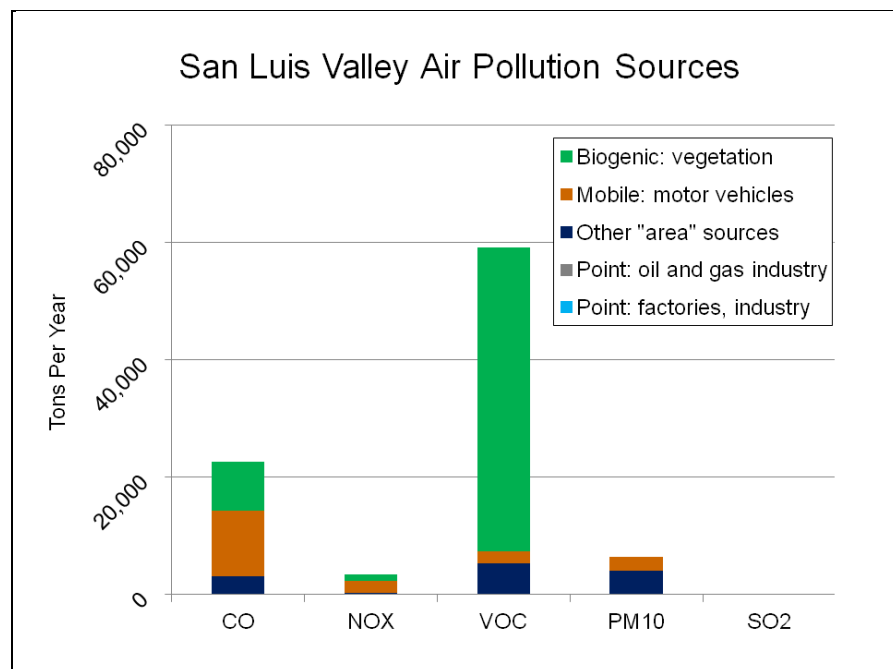
Colorado's San Luis Valley Region is in the south central portion of Colorado and includes a broad alpine valley situated between the Sangre De Cristo Mountains on the northeast and the San Juan Mountains of the Continental Divide to the west. The valley is some 71 miles wide and 122 miles long, extending south into New Mexico. The average elevation is 7,500 feet. Principal towns include Alamosa, Monte Vista and Del Norte. The population is about 45,100 according to 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. All of the area complies with federal air quality standards.

### Air Pollution Sources

- Blowing dust.
- Oil and gas production.
- Motor vehicles.

### Air Pollution Control Measures

- Alamosa Natural Events Action Plan for windblown dust mitigation, which includes elements such as:
  - Blowing dust advisories and forecasting.
  - Public outreach on dust mitigation.
  - Dust control measures, such as street sweeping, curtailing construction activities that disturb soil, applying water to disturbed soils, planting vegetation and wind breaks, reducing or postponing tilling and plowing.
  - Statewide oil and gas emission controls.



## Regional air quality - Southwest

The Southwest Region includes the Four Corners area of Montezuma, La Plata, Archuleta and San Juan counties. The population of this region is about 89,800, according to 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, and tourism and agriculture are dominant industries. Though the oil and gas industry is growing in this area, all of the area complies with federal air quality standards.

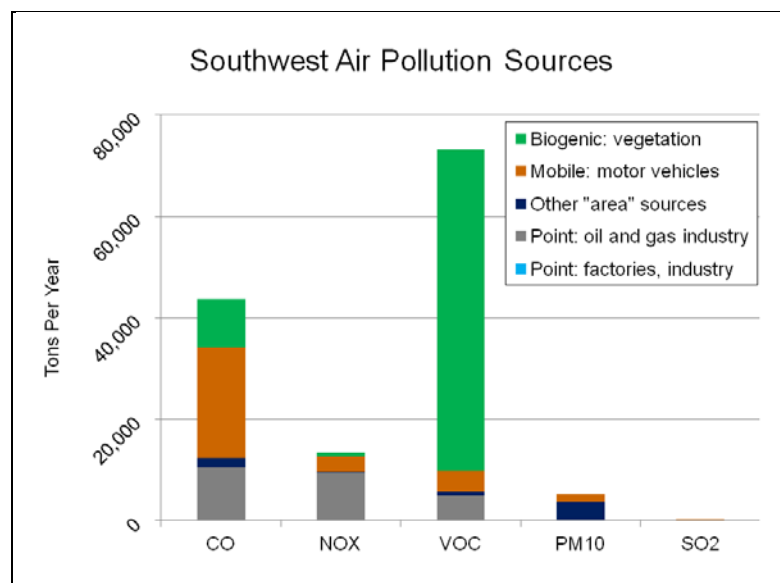
### Air Pollution Sources

- Motor vehicles.
- Natural gas processing and transmission.
- Two coal-fired power plants in New Mexico.
- Gas field development in Colorado, Southern Ute Indian Reservation, and New Mexico.
- Wildfires.
- Durango & Silverton coal-fired steam locomotive tourist train.

### Air Pollution Control Measures

The main air pollution control measures in this region include:

- Statewide oil and gas emission controls.
- Smoke management program.
- Durango Train Smoke Task Force.
- Tribal permitting and control of emission sources.
- Emissions reductions at New Mexico power plants.
- Particulate matter control plan for Pagosa Springs includes: street sweeping and sanding controls, use of chemical deicers, and paving of dirt roads.



## Regional air quality - Western Slope

The Western Slope Region includes nine counties on the far western border of Colorado. A mix of mountains on the east, and 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 about 309,700, according to 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.

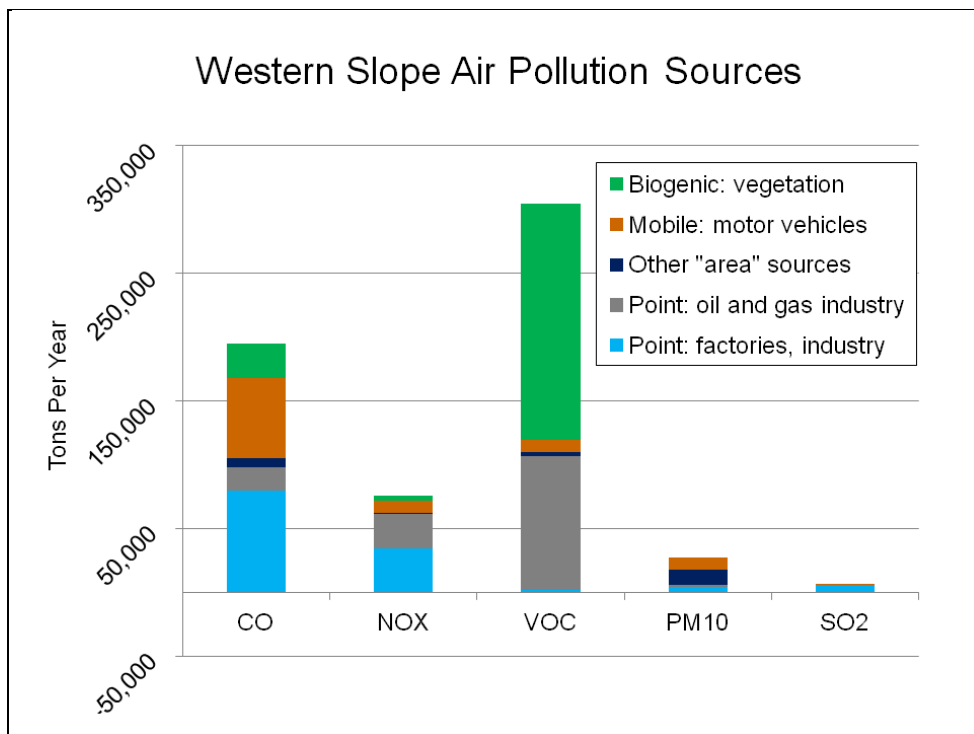
The Western Slope, along with the central mountains, are projected to be the fastest growing areas of Colorado through 2020 with greater than two percent annual population increases, according to the Colorado Department of Local Affairs. All of the area complies with federal air quality standards. However, elevated ozone levels have been recorded in the Rangely area during recent winters, and PM<sub>2.5</sub> in Grand Junction in 2013. These levels do not count as violations of the air quality standards, because the standards are based on three-year averages.

### Air Pollution Sources

- Motor vehicles.
- Oil and gas development.
- Nucla and Craig coal-fired power plants.
- Coal mines in Delta, Mesa, Moffat and Montrose counties.
- Sand and gravel operations.
- Windblown dust.
- Wildfires.
- Prescribed fire.

### Air Pollution Control Measures

- Power plant fluidized bed combustion for sulfur dioxide control, shutdown of the Cameo Plant.
- Statewide controls on oil and gas production.
- Natural Events Action Plan for wildfires.
- Smoke Management Program for prescribed fire.
- Fugitive dust control plans.
- Particulate matter control plan for Telluride includes: wood-burning control measures, street sweeping and sanding controls, use of chemical deicers, and paving of dirt roads.



## Regional air quality - Central Mountains

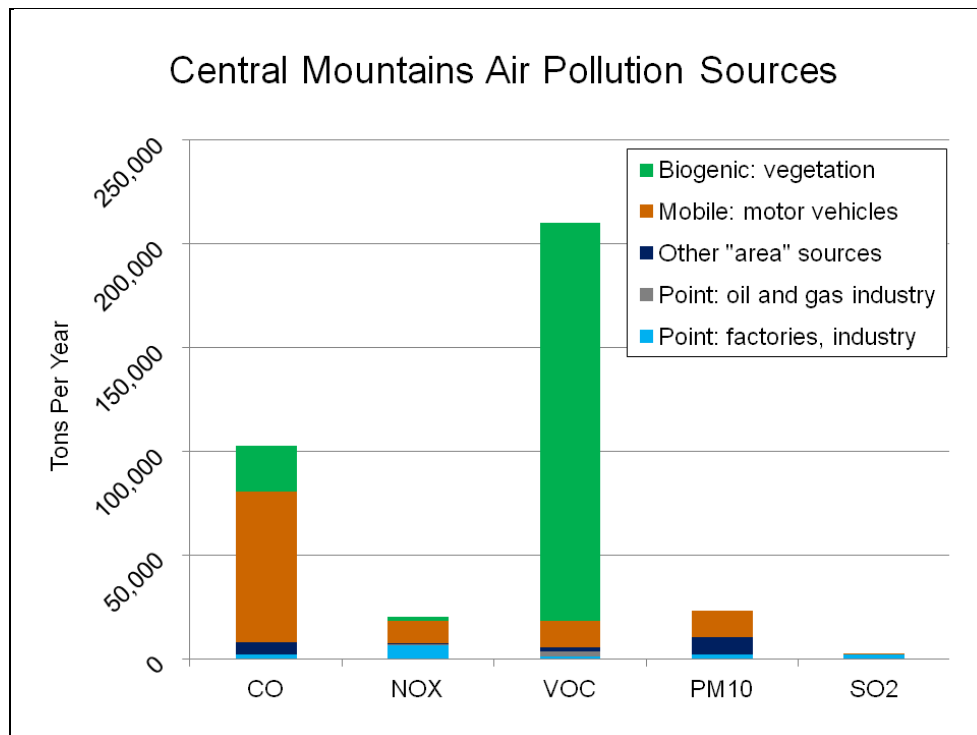
The Central Mountains Region consists of 15 counties in the central area of the state. The Continental Divide passes through much of this region. Mountains and mountain valleys are the dominant landscape. Leadville, Steamboat Springs, Cañon City, Salida, Buena Vista and Aspen represent the larger communities. 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 in Fremont County.
- Sand and gravel operations.
- Black Hills Electric Generating Station in Fremont County.
- Hayden power plant.
- Climax Molybdenum Mine.
- Oxbow and Mountain Coal mining facilities in Gunnison County.
- Wildfires.
- Controlled burning.

## Air Pollution Control Measures

- Power plants: dry limestone scrubbers to reduce SO<sub>2</sub> emissions, fabric filter baghouse to control particulate emissions, low-NO<sub>x</sub> burners/Selective Catalytic Reduction (by 2018) to control NO<sub>x</sub> emissions, shutdown of the Black Hills Plant.
- Holcim Portland Cement plant: Selective non-catalytic reduction emissions for NO<sub>x</sub> reduction, wet limestone scrubbers for SO<sub>2</sub> reduction.
- Smoke management program for large controlled burns.
- Air Pollution Control Plans for Aspen, Cañon City and Steamboat Springs to control particulate matter through woodburning 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.



## Air quality data

A variety of air quality data is available to the public online.

- [Air quality monitoring, modeling and data.](#)
- [Annual Air Quality Data Report.](#)

# Summary of regulations

The following is a summary of the Colorado Air Quality Control Commission's air quality regulations. For on-line access to complete regulations please see the [Air Quality Control Commission regulations website](#).

## Procedural Rules

The rules that the commission follows for its regular monthly meetings and public hearings.

## Air Quality Standards Regulation

This regulation establishes ambient air quality standards for the state of Colorado and dictates monitoring procedures and data handling protocols. It also defines nonattainment area boundaries for locations in the state which historically have violated federal and state air quality standards. In addition, the regulation contains the state's urban visibility standard and sets emission budgets for nonattainment areas.

## State Implementation Plan Specific Regulation

This regulation defines specific requirements concerning air quality control strategies and contingency measures for nonattainment areas in the state.

## Particles, Smoke, Carbon Monoxide and Sulfur Oxides

Regulation Number 1 sets forth emission limitations, equipment requirements and work practices (abatement and control measures) intended to control the emissions of particles, smoke and sulfur oxides from new and existing stationary sources. Control measures specified in this regulation are designed to limit emissions into the atmosphere and thereby minimize the ambient concentrations of particles and sulfur oxides.

## Odor Control

Regulation Number 2 sets standards for allowable odor contaminants for different land-use areas in the state and outlines control measures that can be taken to bring violators into compliance.

## Air Pollution Emission Notices and Permits

Regulation Number 3 requires air pollution sources to file Air Pollution Emission Notices. It also requires that new or modified sources of air pollution - with certain exemptions - obtain preconstruction permits. Very large facilities also are required to obtain operating permits.

## Woodburning Controls

Regulation Number 4 requires new stove and fireplace inserts to meet federal certification in specified areas of the state.

## New Source Performance Standards

Regulation Number 6 sets standards of performance for specific new stationary sources in Colorado. The regulation is designed to bring new sources into compliance with the U.S. Environmental Protection Agency's New Source Performance Standards. In addition, the regulation sets standards for new industries that are unique to Colorado for which the EPA has not yet set standards.

## Volatile Organic Compounds Control

Regulation Number 7 controls the emissions of volatile organic compounds, primarily in the Denver-metro area. It sets standards and mandates controls for specific types of volatile organic compound sources.



## Hazardous Air Pollutants Control

Regulation Number 8 sets forth specific work practices, emission control requirements and standards for hazardous air pollutants and asbestos.

## Open Burning, Prescribed Fire and Permitting

Regulation Number 9 applies to all open burning activities throughout the state to control smoke and emissions from such fires. The regulation sets forth requirements for permitting including prescribed fires, controlled burns and significant users of prescribed fires.

## Transportation Conformity

Regulation Number 10 defines the criteria the Colorado Air Quality Control Commission uses to evaluate the consistency between state air quality standards/objectives, and transportation planning and major construction activities across the state, as defined in state implementation plans.

## Motor Vehicle Inspection Program

Regulation Number 11 requires automobile emission inspection and maintenance programs to be implemented in specified areas of the state for gasoline-powered on-road vehicles. These programs apply to businesses, industry and the general public.

## Diesel Vehicle Inspection Program

Regulation Number 12 defines the state's diesel-powered vehicle emission inspection and maintenance program for on-road vehicles.

## Chlorofluorocarbons

Regulation Number 15 identifies the requirements to control emissions of ozone-depleting compounds from both stationary and mobile sources.

## Street Sanding and Sweeping

Regulation Number 16 sets specification standards for street sanding material and street sweeping practices in the Automobile Inspection and Readjustment program area, and the Denver- metro fine particle nonattainment area.

## Acid Rain Control

Regulation Number 18 sets forth the requirement for implementing the state's acid rain program. This program is adopted by reference from the federal program found in 40 C.F.R., Part 72 as in effect on Jan. 6, 1994.

## Lead Based Paint

Regulation Number 19 defines the requirements for certifying lead abatement professionals and work practice measures.

# Enforcement report

This page summarizes enforcement actions of the Air Pollution Control Division. A full enforcement report for stationary sources of air pollution in Colorado is available at: [Stationary sources enforcement action reports](#).

## Enforcement Summary July 2014 - June 2015

Actions	Stationary Sources	Asbestos Unit	CFC Unit	Lead Unit
Warning Letters	53	5	0	0
Compliance Advisories	49	n/a	n/a	n/a
Notices of Violation	18	39	0	0
Notices of Noncompliance (schools only)	n/a	40	0	n/a
Compliance Orders	1	25	0	0
Compliance Orders on Consent	58	0	0	0
Early Settlement Agreements	78	41	0	0
AQCC Hearings	0	0	0	0

## Glossary of Terms

**Compliance Advisory (CA):** The division issues these to provide timely notice to a facility of apparent violations found during an inspection. The division may or may not initiate a formal enforcement action, depending on the type of violation and the response of the facility.

**Compliance Order (CO):** If the division determines that a violation or noncompliance did occur after a notice of violation conference, it may issue a compliance order. The order includes the final determinations of the division regarding the violation or noncompliance, a summary of the proceedings at the notice of violation conference, and an evaluation of the evidence considered by the division in reaching its final determination of law.

**Compliance Order on Consent (COC):** A settlement agreement or express terms, mutually agreed upon in writing, between the recipient of an informal notice of noncompliance, notice of violation, or compliance order and the division, resolving the discovered noncompliance issues.

**Noncompliance Penalty (NCP):** A penalty assessed pursuant to § 25-7-115(5), C.R.S., to ensure a source does not reap the economic benefit of noncompliance with a federal requirement, as required under 42 U.S.C. § 7420.

Notice of Noncompliance (NON): Issued to a school and requires the school to take certain steps to come into compliance. If the school comes into compliance within the stated time period, the division does not require the school to pay a civil penalty.

Notice of Violation (NOV): Issued by the division to provide specific notice to a company of the provisions alleged to have been violated, and the division's factual basis and legal conclusions for the allegations.

Warning Letter: A written notification to a source that the division has documented a violation that further recurrence could result in enforcement action being taken, but that no further enforcement action will result directly from the instant violation.

## Roles of government and the public

Protecting air quality is a cooperative effort among many parties. Government agencies are responsible for assuring that air quality meets health and environmental standards. The public has an important role through lifestyle habits, consumer choices and energy usage. Find out more from the following fact sheet: [Roles of government and the public](#).