Report to the Public 2016-2017

COLORADO

Air Quality Control Commission

Department of Public Health & Environment

COLORADO

Report contents:

Colorado Air Quality Control Commission
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Message from the Chair…

During my tenure with the Air Quality Control Commission, and now speaking as its Chair, I have appreciated the efforts of my fellow commissioners, the Air Pollution Control Division staff, and most of all stakeholders and the public for devoting their time and energy to air quality matters in Colorado. Many viewpoints have been brought forth, and I continue to be impressed with the dedication shown by the many who have participated at our public meetings and watched our meetings via webcast. I invite you to continue to participate and provide comments to the Commission in writing, by email and making oral statements.

During this past year, significant activities of the Commission included:

- Holding its annual retreat in Fort Morgan and solicited public comments on air pollution issues in northeastern Colorado. The Commission also toured a local dairy and a cattle feeding operation to gauge how good practices can reduce emissions and improve air quality.
- Approving an updated ozone plan for the Denver/North Front Range region nonattainment area, which is designed to improve public health and bring the area closer to attaining federal ozone standards.
- Hosting a science forum in Boulder that brought together experts from across Colorado to present results and recommendations from their cutting-edge scientific research.
- Approving a consensus proposal to close Unit 1 at the Craig Power Station in northwest Colorado and the entire Nucla Station in western Colorado. These closures and the associated emission reductions will further improve visibility resources in national parks and wilderness areas and reduce greenhouse gas emissions.

This coming year the Commission will focus its attention on:

- Additional emission controls for the oil and gas industry intended to improve ozone conditions in the nonattainment area.
- A greenhouse gas reporting rule for Colorado as directed by Governor Hickenlooper's "Supporting Colorado's Clean Energy Transition" executive order.
- Innovative approaches for improving outreach and information sharing in the Four Corners region.
- Investigating further measures that could help in reducing emissions that contribute to climate change and elevated ozone levels.

I hope that your exploration of this report proves informative and inspires you to contribute to our air quality planning efforts.

Jana Milford

Major air pollutants

There are many types of air pollution, from blowing dust to human-caused chemical emissions. As required by the Clean Air Act, 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 is an urgent concern, and Colorado, other U.S. states, cities and businesses, and countries around the world are undertaking steps to reduce greenhouse gas emissions and their impacts.

Monitoring the Pollutants

The Colorado Air Pollution Control Division (division) maintains a statewide monitoring network for all criteria pollutants as required by the federal Clean Air Act and at times conducts special studies for criteria and toxic air pollutants. Monitors are placed in areas where emissions sources and modeling suggest that air quality could be most impacted.

The following provides 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.

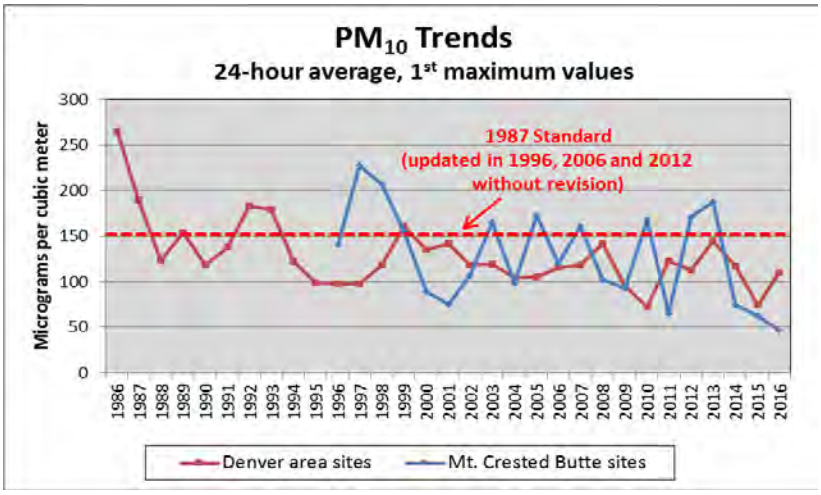
- Particulate matter.
- Ground-level ozone.
- Nitrogen oxides.
- Sulfur Dioxide.
- Carbon Monoxide.
- Lead.
- Hazardous air pollutants.
- Greenhouse gases.
- Regional haze.
- More information.

Major air pollutants - particulate matter

Particles in the air are made up of a number of components, including inorganic ions (such as nitrate, sulfate, and aluminum), organic chemicals, carbon, metals, and soil or dust particles. Monitoring is performed for particles less than 10 microns in diameter (PM_{10}) and for particles less than 2.5 microns in diameter ($PM_{2.5}$). A micron is 1 millionth of a meter. A human hair is about 60-70 microns in diameter.

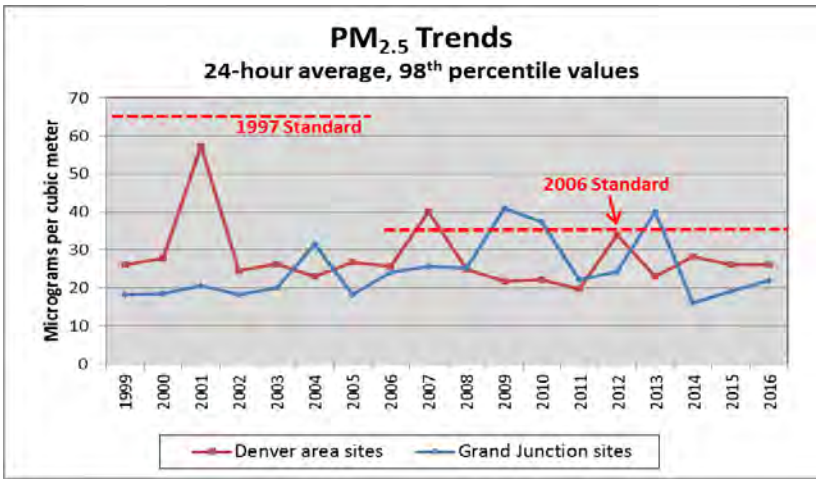
PM_{10}

PM_{10} consists of solid and liquid material up to 10 microns in size suspended in the atmosphere. In Colorado, the majority of PM_{10}, about 90 percent, is from fugitive dust sources, including agriculture, construction, and paved and unpaved roads, according to the EPA's 2014 National Emissions Inventory (NEI). Trends are shown in the graph below for the maximum concentration by year for all Denver metro area monitors, to provide a large city perspective, and for Mt. Crested Butte monitors, to provide a mountain ski town perspective.



$PM_{2.5}$

$PM_{2.5}$ particles are a subset of PM_{10}. $PM_{2.5}$ can be directly emitted from stack emissions, internal engine combustion, wildfires or fugitive dust sources, or it can form when gases emitted from power plants, industries, automobiles, and agriculture react in the air. In Colorado, about 63 percent of directly emitted $PM_{2.5}$ is from fugitive dust sources while roughly 13 percent is from fire-related activities, such as prescribed fires, wildfires, and residential wood smoke, according to EPA's 2014 NEI. Much of the $PM_{2.5}$ in many urban and industrial locations is secondary – formed through atmospheric chemical reactions from other directly emitted pollutants, which is composed of sulfate, nitrate and ammonium compounds. Trends are shown in the graph below for the maximum concentration by year for all Denver metro area monitors, to provide a large city perspective, and for Grand Junction monitors, to provide a western slope inversion-influenced perspective.



Health and Environmental Effects

Particulate matter can enter the lungs. Once inhaled, PM_{10} and $PM_{2.5}$ 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 and vegetation damage to climate change.

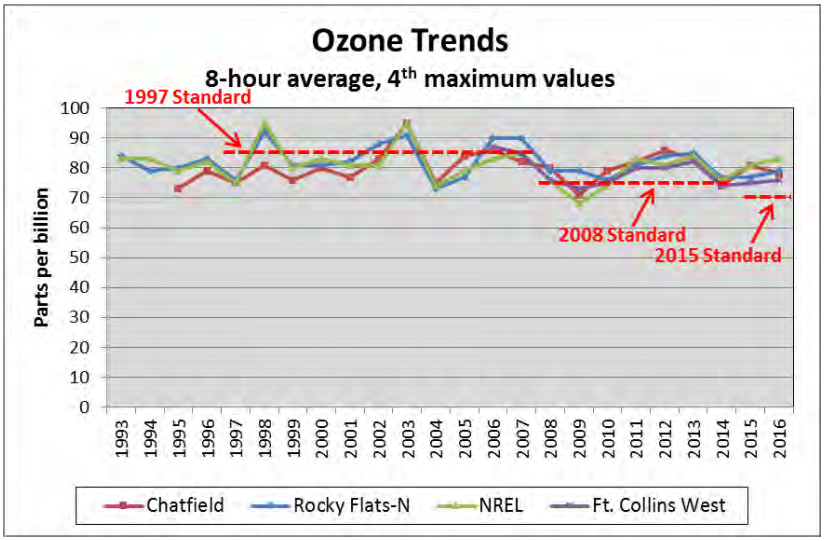
Impacts in Colorado

All monitoring sites in Colorado meet the federal standards for both PM_{10} and $PM_{2.5}$ pollution. However, particle pollution at times can cause localized air quality impacts resulting in adverse health impacts. The division regularly issues advisories, encouraging citizens to minimize activities that cause emissions or encouraging citizens to limit exposure to poor air quality.

The charts show exceedances of particulate standards in recent years. These exceedances were exacerbated either by winter temperature inversions that trap pollutants close to the ground or high winds that resulted in blowing dust. These exceedances do not result in violations because the standards are based on 3-year averages of monitored concentrations, 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 is not emitted directly. Instead, emissions of VOCs and NOx from motor vehicles, industry, power plants, oil and gas production, and even vegetation contribute to ozone formation. Ozone is also transported into Colorado from other states and countries, and is exported from Colorado to states downwind. Trends are shown in the graph below for the four North Front Range area monitors that have historically recorded the highest concentrations in Colorado.



Ozone is colorless and odorless at ambient concentrations. In the upper stratosphere, naturally occurring ozone helps protect the earth from ultraviolet radiation. Colorado's highest ground-level ozone concentrations usually occur in the summer when hot, low-wind days cause reactive pollutants to build-up and form ozone. However, high ozone events have been observed in some rural areas in winter where oil and gas production activities are concentrated in basins that can trap air pollution. In addition to enforcing regulations that address ozone precursors, the division and the Regional Air Quality Council regularly issue advisories, encouraging citizens to voluntarily minimize activities that cause emissions and encouraging citizens to limit exposure to poor air quality.

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.

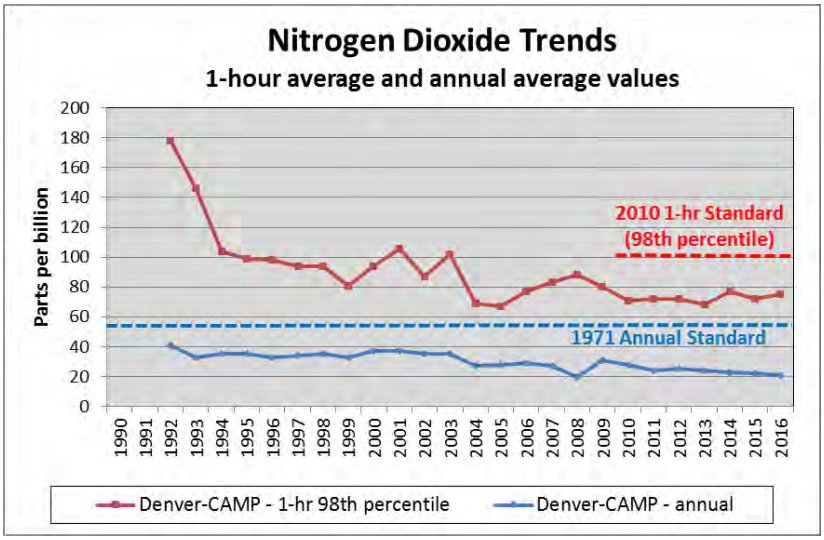
Impacts in Colorado

Much of Colorado has attained and continues to attain federal ozone standards. However, the Denver Metropolitan and North Front Range areas have a history of violating these standards. The region has violated older, less stringent standards since the 1970's and throughout the 2000's. With EPA's promulgation of the more stringent 2008 8-hour standard of 75 parts per billion, and with EPA designating the region as a "marginal nonattainment area" in 2012, the state has continued efforts to reduce emissions aimed at attaining the ozone standard. Unfortunately, the region still violates the 2008 standard and was bumped up to a "moderate nonattainment area" by EPA in 2016. A revised State Implementation Plan was approved by the Commission in November 2016 and submitted to the EPA for this moderate designation.

In recent years, the commission has taken a number of regulatory efforts to reduce ozone levels. In 2014, the commission adopted new requirements to reduce hydrocarbon emissions from the oil and gas production sector that lead to ozone formation. When fully implemented, the regulatory revisions are expected to reduce VOC emissions by 93,000 tons per year in Colorado. In 2011, the commission approved a plan for reducing regional haze 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 are expected to occur by the year 2018 through these actions. New federal motor vehicle emissions standards and Colorado's motor vehicle inspection and maintenance programs also help reduce precursors of ozone. In October 2015, the EPA adopted a new, more stringent ozone standard of 70 parts per billion. EPA is expected to identify nonattainment areas for the 70 ppb standard in October 2017, initiating the implementation process.

Major air pollutants - nitrogen oxides

Nitrogen oxides comprise a group of highly reactive gases that contain nitrogen and oxygen in varying amounts. NOx play a major role in the formation of ozone, particulate matter, haze and acid rain. NOx is an "ozone precursor." The majority of NOx is nitrogen dioxide (NO_2) and nitric oxide (NO). NO_2 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 NOx emissions are high-temperature combustion processes such as those in automobiles, industrial engines and power plants. Trends are shown in the graph below for the Denver metro area monitor that has historically recorded the highest concentrations.



Health and Environmental Effects

NOx reacts in the air to form ground-level ozone and fine particle pollution, which are associated with adverse health effects. NO_2 can increase respiratory problems, cause symptomatic effects in asthmatic individuals and increase susceptibility to respiratory infections.

NOx 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. Alpine ecosystems such as those in Rocky Mountain National park are especially sensitive to these over-fertilization effects. 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. NOx can also contribute to visibility impairment.

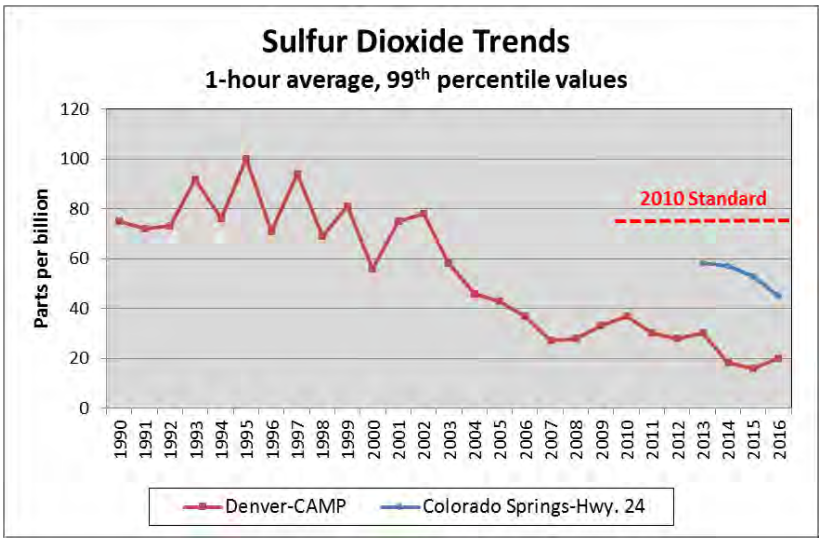
Impacts in Colorado

The division monitors NO_2 at five sites in Colorado: downtown Denver's CAMP station; Welby just north of Denver; just south of downtown Denver near Interstate 25; just north of downtown Denver near the Interstate 25/Interstate 70 intersection; and in northwest Denver near Pecos Street and Interstate 70. All sites show NO_2 values that are below the national ambient air quality standards. The Bureau of Land Management, local and tribal governments also monitor NO_2 in Colorado and report their data to the EPA's Air Quality System data base. These monitors also show levels below NO_2 standards.

Major air pollutants – sulfur dioxide

Sulfur dioxide (SO_2) is one of a group of highly reactive gases known as "oxides of sulfur," or sulfur oxides (SOx). The largest sources of SO_2 emissions are from coal combustion at power plants and other industrial facilities. Smaller sources of SO_2 emissions include industrial processes, on- and off-road diesel vehicles, and the burning of high sulfur fuels by locomotives and non-road equipment. Furthermore, SO_2 is oxidized to form sulfate, in the form of sulfuric acid or ammonium sulfate. These compounds are major contributors to acid rain, as well as fine sulfate particles in the $PM_{2.5}$ fraction, which degrade visibility and represent a human health hazard.

Trends are shown in the graph below for the Denver metro area monitor that has historically recorded the highest concentrations and for Colorado Springs, which is the other area in Colorado required to have a monitor and is near a coal-fired power plant.



Health and Environmental Effects

High concentrations of sulfur dioxide can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated sulfur dioxide levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of sulfur dioxide, in conjunction with high levels of particulate matter, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. The subgroups of the population that may be affected under these conditions include individuals with heart or lung disease, as well as the elderly and children.

Impacts in Colorado

Colorado does not have a history of violating health standards for sulfur dioxide. The historical concern in Colorado with sulfur dioxide has been associated with acid deposition and its effects on mountain lakes and streams, as well as the formation of fine aerosols. In 2010, EPA issued a new, more stringent 1-hour sulfur dioxide national ambient air quality standard that has a shorter averaging period.

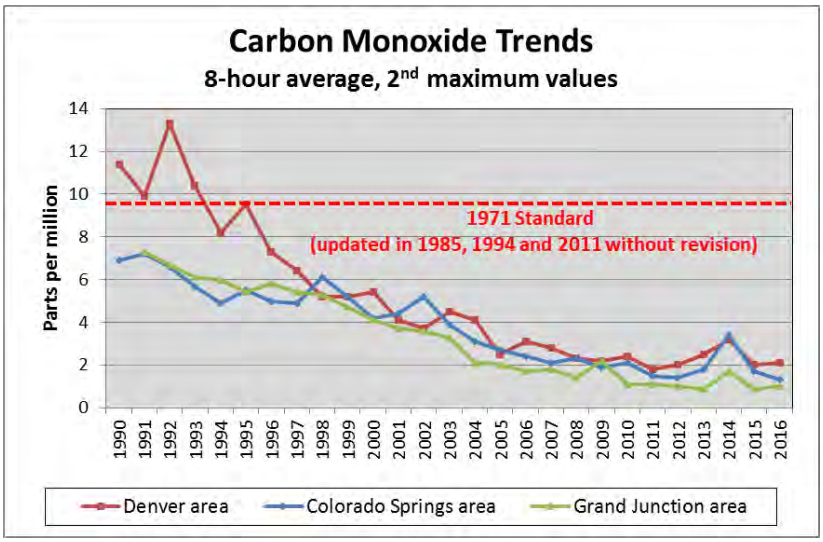
Historically, the site with the highest annual average of 1-hour average concentrations recorded by the division monitors has been the Denver CAMP monitor. Since 1990, the 1-hour design value at the Denver CAMP monitor has declined from a high in 1992-1994 of 125 ppb to 12 ppb in 2014-2016. Due to concerns about SO_2 emissions from the Martin Drake power plant, the Highway 24 (Colorado Springs) site was outfitted with an SO_2 monitor in January of 2013. This site is below the standard with the 2014-2016 design value at 52 ppb.

In August 2015, the commission approved a recommended designation of unclassifiable for locations near two coal-fired power plants, one in Colorado Springs (Martin Drake Power Plant) and another outside Fort Morgan (Pawnee Power Plant). EPA has since approved these designations. Since that time, Colorado Springs Utilities (CSU) finished collecting on-site meteorological data for the Martin Drake plant at the end of January 2017.

This data, which incorporates a better understanding of local weather phenomena, is included in a modeling protocol to the division and EPA. The division will use the results of this analysis as a part of the assessment to determine compliance with the SO_2 standard for the area surrounding the Martin Drake Power Plant. The commission also approved attainment/unclassifiable recommendations for six other coal-fired power plants located throughout Colorado in March 2017. EPA has yet to act on this recommendation.

Major air pollutants – carbon monoxide

Carbon monoxide (CO) is a colorless and odorless gas formed when carbon compounds in fuel undergo incomplete combustion. The majority of CO emissions to ambient air originate from mobile sources (i.e., transportation), particularly in urban areas, where as much as 85% of all CO emissions may come from automobile exhaust. CO can cause harmful health effects by reducing oxygen delivery to the body's organs and tissues. High concentrations of CO generally occur in areas with heavy traffic congestion. In Colorado, peak CO concentrations typically occur during the colder months of the year when automotive CO emissions are highest and nighttime temperature inversions are more frequent. Trends are shown in the graph below for the maximum concentration by year for three large metropolitan areas across Colorado.



Health and Environmental Effects

CO affects the central nervous system by depriving the body of oxygen and the health effects of CO vary with concentration. At levels above the standard, these effects range from fatigue in healthy people and chest pain in people with heart disease at lower concentrations to impaired vision and coordination, headaches, dizziness, confusion, and nausea at much higher levels.

Impacts in Colorado

Outdoor CO concentrations have dropped dramatically since the early 1970s due to national vehicle emission controls. This change is evident in both the concentrations measured and the number of monitors that have exceeded the level of the 8-hour standard. In 1975, 9 of 11 (81%) state-operated monitors exceeded the 8-hour standard of 9 ppm. In 1980, 13 of 17 (77%) state-operated monitors exceeded the 8-hour standard. Since 1996, no state-operated monitors have recorded a violation of the 8-hour standard. The 8-hour annual maximum concentrations have declined from more than three times the standard in the late 1960s to about one quarter of the standard today.

Indoor CO poisoning still occurs, especially when home heating furnaces malfunction. These incidents can lead to deaths. It is important for people to install and maintain indoor CO detection monitors to prevent these tragic events. For more information, visit EPA's website on carbon monoxide's impact on indoor air quality.

Major air pollutants – lead

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 0.15 micrograms per cubic meter.

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, airborne lead levels monitored in Denver have decreased by more than 95 percent and are at or near the minimum levels of detection for laboratory equipment. 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 low levels of detection. All stand-alone monitoring by the division for lead was discontinued at the end of 2016 due to the very low levels being recorded. Lead is now only measured in Grand Junction as part of the measurements for the National Air Toxics Trends site.

Lead paint in older homes remains an issue. The commission regulates certification and training programs for individuals and firms conducting lead paint abatement, and has work practice standards for these activities.

Major air pollutants - hazardous air pollutants

Hazardous air pollutants, also known as air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects. Examples include benzene, which is found in gasoline and released from oil and gas production activities; 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.

The Clean Air Act lists 187 air toxics and directs EPA to develop emissions standards for specific industries. These standards are called the National Emission Standards for Hazardous Air Pollutants (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 the 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 commission.

Air toxics also are reduced through other efforts such as automobile inspection and maintenance, ozone reduction measures to reduce volatile organic chemicals, a diesel school bus emissions control retrofit program, and pollution prevention in industries and communities statewide. In 2007, the commission adopted a rule called "Colorado's Utility Hg Reduction Program", with the purpose of reducing mercury emissions from coal-fired power plants. This rule was developed in response to EPA's Clean Air Mercury Rule, but sought greater mercury emission reductions, more quickly. In February 2015, the commission revised the state-only regulation to align with new federal mercury requirements for coal-fired power plants.

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 conducted, including in Denver, Grand Junction, Pueblo, Platteville and Garfield County. Overall, these studies have found that air toxics levels are below EPA levels of concern, though locally higher levels may be found near sources, both in urban areas and rural areas. An example in rural areas is oil and gas development, which can have temporarily higher emissions during portions of the drilling and completions process, such as flowback. Additional risk assessment studies are being performed on these data to assess potential health impacts.

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 due to combustion of fossil fuels and other human activities, the Earth's climate is impacted. Actions taken by the commission have helped to reduce GHG emissions. For example, the Regional Haze State Implementation Plan (SIP) and 2016 revisions to that SIP incorporate significant reductions in GHG emissions from electrical generating units due to coal power plants retiring and/or repowering with natural gas. The commission's February 2014 oil and gas requirements have significantly reduced methane emissions from the sector, and are the first set of reduction strategies in the nation aimed at methane.

The division developed a Greenhouse Gas Inventory for the State of Colorado (2014). The inventory shows data from all sectors in Colorado based on EPA's State Inventory Tool (SIT) Model and is available on the division's website at Colorado greenhouse gas reports. For the year 2020, Colorado's inventory projects carbon dioxide to make up approximately 74 percent of greenhouse gas emissions, methane to make up approximately 21 percent, with nitrous oxide and fluorinated gases contributing the balance (based on the global warming potential of each gas).

The three largest sources of greenhouse gas emissions from human activities in Colorado are electric generation, transportation, and buildings (shown in the inventory as residential, commercial and industrial fuel use). Other categories of greenhouse gas emissions in Colorado include oil and gas exploration and development, agriculture, forestry, coal mining, other land use, and waste management including landfills.

Environmental Effects

Accumulation of greenhouse gases in the atmosphere leads to rising temperatures, shifting snow and rainfall patterns, and is expected to increase the intensity of climate events such as floods, heat waves, and tropical storms. Glaciers, snowpack and sea ice are shrinking, oceans are rising, and droughts are longer and more intense in some areas.

Impacts in Colorado

A number of observed and projected climatic changes have been cited in Colorado and 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.

Federal permitting requirements for major sources of greenhouse gases were established in 2011. Colorado has a similar GHG permitting program. Major sources may need to limit their emissions of GHG or implement emissions control equipment known as Best Available Control Technology. Other regulations that 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 commission.

Federal regulations require certain sources to report their GHG emissions. On July 11, 2017, Governor John Hickenlooper signed Executive Order D 2017-015, supporting a transition to clean energy in Colorado. In response to this executive order, the division and the commission will be working to develop and propose a state greenhouse gas emissions reporting rule by the end of 2018.

For additional information on the impacts of climate change in Colorado, see the Colorado Water Conservation Board's Climate Change in Colorado report and the Colorado Department of Local Affairs funded studies of the impact of climate change on extreme heat events in the Front Range.

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 is sometimes reduced substantially by air pollution. Based on Colorado's most recent 5-year progress report, visual range in the Class I areas (national parks and wilderness areas) is improving. 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. The deposition of reactive nitrogen compounds in the form of nitrate, ammonia, or ammonium can lead to over fertilization of alpine ecosystems such as those 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 twelve 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 commission adopted a Regional Haze SIP in January 2011 with revisions approved in November 2014 and December 2016. The EPA approved this plan in October 2012; approval of the revised plan is pending. The process included a detailed analysis of regional haze and its sources, and established emissions controls for major industrial sources of haze.

In November 2015, the commission adopted a regional haze progress report that provided data and analysis on improving visibility conditions at Colorado's twelve Class I areas. In December 2016 the commission approved a revision to the Regional Haze SIP that requires Craig Station Unit 1 to either retire by the end of 2025 or switch to natural gas, in which case it must cease burning coal by August 2021 and begin firing natural gas by August 2023. The December 2016 Regional Haze SIP revision also requires the Nucla Station to retire by the end of 2022.

Major air pollutants - more information

Air quality.
Statewide monitoring data, current air quality, and 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 represent status of regional haze, sources, and strategies that will reduce regional haze.

Nitrogen deposition at Rocky Mountain National Park.
Current status of 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

Ozone Reduction

The Denver Metropolitan and North Front Range nonattainment area is in the midst of a multi-year effort to reduce ground-level ozone concentrations to comply with federal ozone standards. The area was designated by the EPA as a "marginal" nonattainment area for the 75 parts per billion (ppb) ozone National Ambient Air Quality Standard in 2012. While ozone concentrations have improved over time, the region did not attain the 75 ppb standard by the July 20, 2015 attainment deadline so EPA reclassified the region as a "moderate" nonattainment area.

In late 2016, the commission adopted a revised State Implementation Plan (SIP) to further reduce ozone levels for the Denver Metropolitan and North Front Range nonattainment area. The plan includes detailed technical analyses regarding the formation of ozone, future trends in ozone levels, strategies to reduce ozone, and other elements. It includes the measures deemed necessary to comply with the standard by the 2018 deadline. In keeping with the SIP requirements, the division has been working with external stakeholders to define Reasonably Available Control Technology (RACT) for different emission sources.

The EPA adopted a new ozone standard of 70 ppb in October 2015. In September 2016, the commission adopted the recommendation that the nine-county Denver Metropolitan and North Front Range area be designated non-attainment with the new standard, based on monitoring data for 2013 – 2015. No other areas in the state were recommended for a non-attainment designation. EPA is currently expected to act on this recommendation in fall 2017, setting the stage for a new round of SIP revisions to adopt measures needed to meet the new standard. Meanwhile, the 75 ppb (2008) standard is still in place and Colorado has until July 2018 to comply. If the Denver Metropolitan and North Front Range nonattainment area misses this deadline it could be bumped-up again, to a "serious" classification, as early as 2019.

The division, the commission and the Regional Air Quality Council are working with external stakeholders to determine the best path forward to reduce emissions of ozone-causing pollutants, in a continued effort to protect public health and the environment. Existing regulatory programs continue to reduce emissions from power plants, oil and natural gas facilities, motor vehicles, and other sources. The division is implementing new programs such as an Emission Reduction Credit program to incentivize sources to shut down or modify high emitting sources. The division has also begun issuing ozone forecasts to alert sources in advance, encouraging them to voluntarily reduce their emissions on days when ozone is expected to be high. The division, Regional Air Quality Council, and partner agencies are looking at ways to incentivize reductions of ozone-causing pollutants using resources available through the Volkswagen settlement. The division and the Regional Air Quality Council are also evaluating potential emission reductions from motor fuels, consumer products, and architectural, industrial and maintenance coatings.

Emission reductions from oil and gas sources

To further reduce ground-level ozone, improve air quality, and comply with federal requirements, the division, the commission and the Regional Air Quality Council have worked with external stakeholders to reduce emissions from oil and natural gas sources. On October 27, 2016, EPA finalized the Control Technique Guidelines for the Oil and Natural Gas Industry (Oil and Gas CTG). As a result of the reclassification of the Denver Metropolitan and North Front Range nonattainment area, Colorado has until October 27, 2018 to submit a revision to the State Implementation Plan (SIP) that addresses the new Oil and Gas CTG.

After working with stakeholders, in July 2017 the division proposed a rule package to the commission that implements new regulations for emissions from oil and gas sources, and revises some provisions that are already in the state regulations. The division is proposing to include Reasonably Available Control Technology (RACT) requirements for existing and new centrifugal compressors, reciprocating compressors, pneumatic pumps, and pneumatic controllers at gas plants, equipment leaks at natural gas processing plants, and fugitive emissions at well production facilities and natural gas compressor stations in the Denver Metropolitan and North Front Range nonattainment area. These proposed revisions will build upon the existing requirements in Regulation No. 7 and in Colorado's ozone SIP.

In the 2017 rule package, the Division proposes to move the state-only requirements for Colorado's Leak Detection and Repair program into the ozone SIP. The proposal also adds state-only provisions that require inspection and maintenance for continuous bleed and intermittent pneumatic controllers at well pads and compressor stations. These added control measures for pneumatic controllers will decrease VOC emissions and help reduce ground-level ozone concentrations in the nonattainment area.

These new provisions are expected to reduce VOC emissions and secure additional greenhouse gas emissions as a co-benefit. The VOC emission reductions from oil and gas sources are estimated to be more than 6,000 tons per year.

Greenhouse Gas Emissions Reduction

The federal Clean Power Plan is currently on hold, however on July 11, 2017, Governor John Hickenlooper signed Executive Order D 2017-015 supporting a transition to clean energy in Colorado. This executive order sets ambitious goals for the state, including a 25% reduction in CO_2 emissions from the electricity sector by 2025 and a 35% reduction by 2030 when compared to 2012 levels. Even before this executive order was signed, a number of actions were underway to reduce power plant GHG emissions. In Colorado Springs, Martin Drake Power Plant Unit 5 retired in 2016. Cherokee Generating Station Unit 4, in Commerce City, will be switching from burning coal to burning natural gas by the end of 2017. In Boulder, Valmont Station Unit 5 is set to retire by the end of 2017. The Nucla Station and one coal unit at the Craig Station will retire or switch to natural gas between 2021 and 2025. These retirements and modifications, which are required by the Colorado Clean Air Clean Jobs Act and the Regional Haze SIP, will decrease greenhouse gas emissions from Colorado's electricity sector.

Colorado has already set national precedent by implementing the first methane reduction rules for oil and gas sources in the country. In the rule package drafted in response to EPA's Oil and Gas CTG, the proposed control measures will reduce VOC emissions from oil and gas sources, as well as secure additional greenhouse gas reductions. In response to Governor Hickenlooper's executive order, the division and the commission will be working to develop a state greenhouse gas emissions reporting rule for adoption by the end of 2018.

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.

- 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 (according to the U.S. Census Bureau as of 2010). This area includes Rocky Mountain National Park and several wilderness areas.

In the past, the Denver-metropolitan area violated health-based air quality standards for ozone, carbon monoxide and fine particles. In response, the Regional Air Quality Council, the division and the commission 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.

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. Recently, the Denver Metro/North Front Range was "bumped-up" to a "moderate" nonattainment area classification for the 2008 ozone standard, which triggered the requirement to develop an updated ozone plan. This plan was adopted by the commission in the fall of 2016.

In order to improve air quality and reduce harmful emissions from mobile sources in the Denver Metro/North Front Range, the division and the Colorado Department of Revenue jointly administer the Automobile Inspection and Readjustment (AIR) Program. Mobile source emissions constitute one of the larger categories of controllable emissions that contribute to summertime ozone concentrations and are the largest source of CO emissions in the metropolitan area. The AIR Program detects and requires repair of excessively emitting gasoline-powered vehicles, and is facilitated by an Inspection and Maintenance network that consists of 18 Air Care Colorado inspection stations throughout the Denver Metro/North Front Range. In 2016, the AIR Program inspected 1,068,000 vehicles, reducing 25.9 tons per day of ozone precursor emissions.

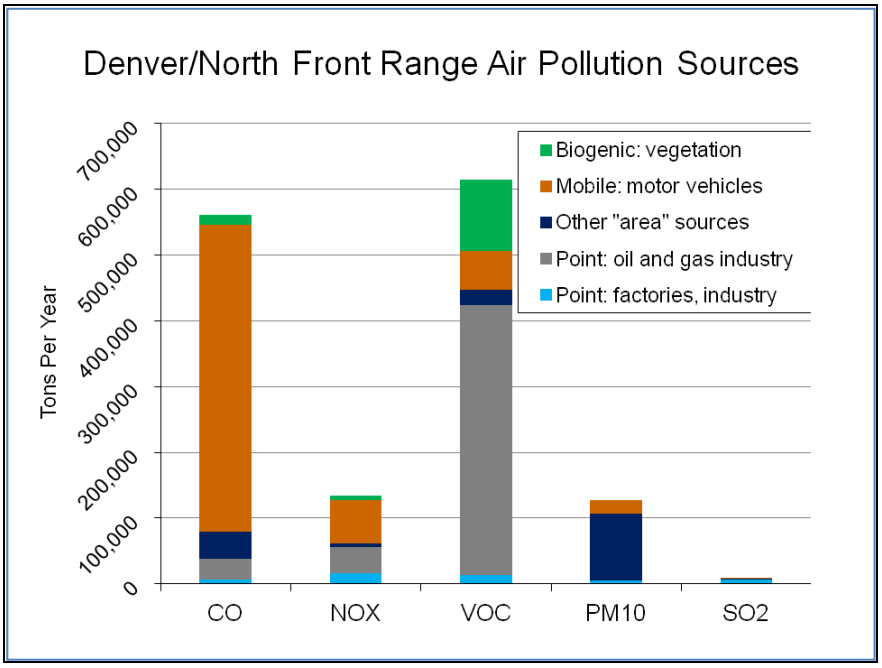
Rocky Mountain National Park has been impacted by nitrogen deposition, which is causing changes to the alpine plant and aquatic environments. A nitrogen reduction plan is in place and progress is being tracked by the National Park Service, the division, EPA and the commission. For more information on this groundbreaking initiative see the Rocky Mountain National Park Initiative website.

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

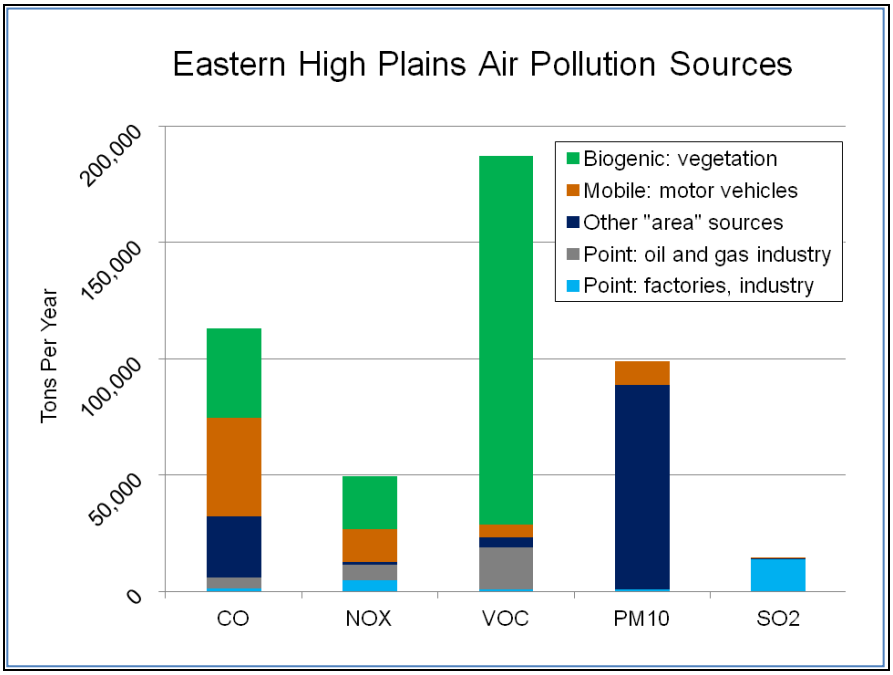
The Eastern High Plains region makes up 40 percent of Colorado's land area and encompasses the counties on the plains of eastern Colorado. The area is semi-arid and often windy. The area's population is approximately 157,000 according to 2010 U.S. Census Bureau estimates. Its major population centers 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.

Air Pollution Control Measures

- Lamar revised particulate matter control plan, which includes dust control measures for the area, and was approved by EPA in June 2016.
- 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.



Regional air quality - South Central

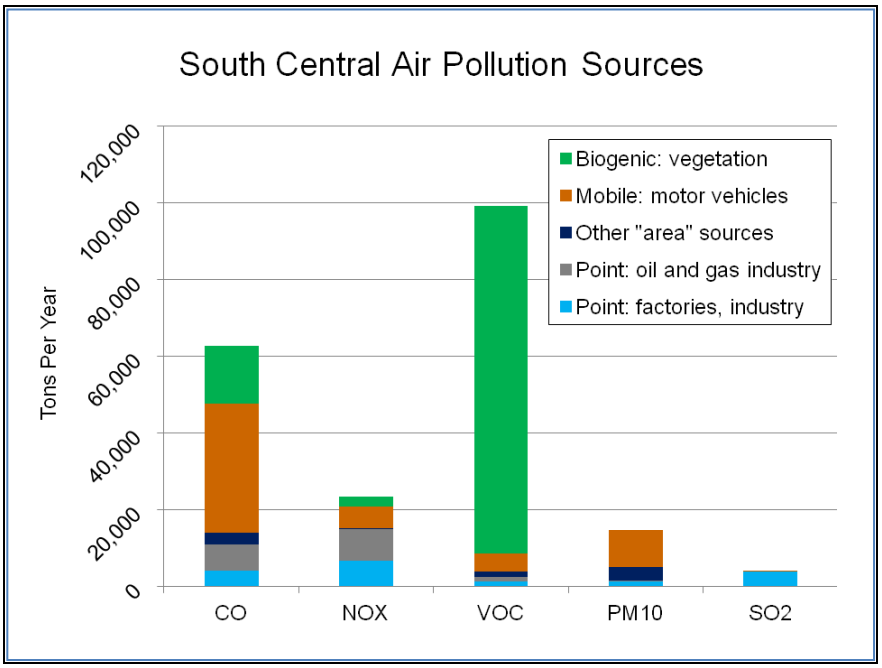
The South Central Region is comprised of Pueblo, Huerfano, Las Animas and Custer counties. Its population is approximately 184,800 according to 2010 U.S. Census Bureau estimates. Urban centers include Pueblo, Trinidad and Walsenburg. The region has rolling semiarid plains to the east and is mountainous 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 near 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, SO_2 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 2010 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

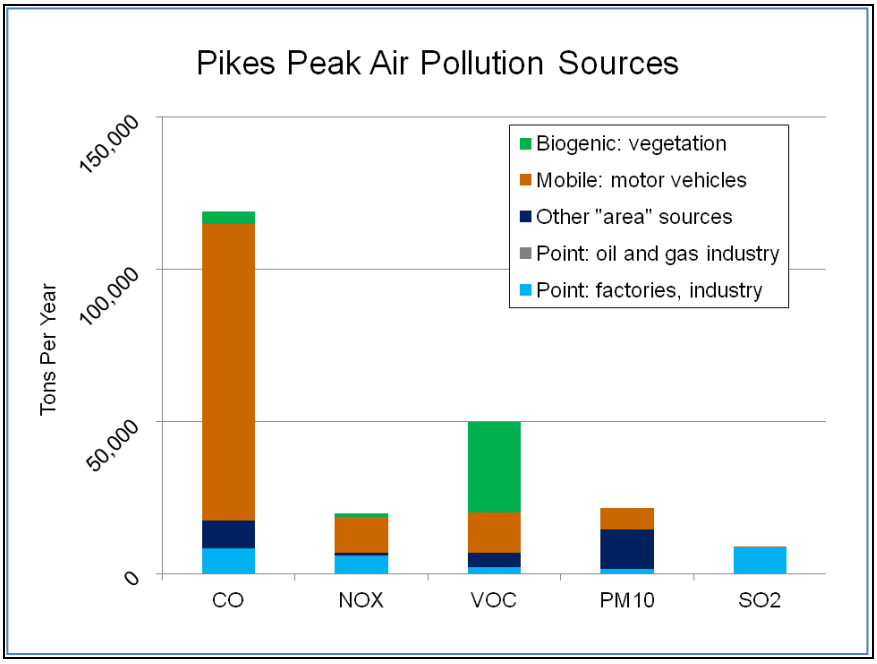
As in other urbanized areas in Colorado, pollutants in the Pikes Peak Region originate primarily from stationary and mobile sources.

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

Air Pollution Control Measures

- Street sweeping.
- Dust control plans.
- Lime spray dryer (or similar controls) and low NOx burners at power plants to control SO_2 and NOx emissions.
- Statewide oil and gas emission controls.

Assessment of the Drake power plant for its impact on the 1-hour SO_2 standard is ongoing.SO_2 monitoring of the plant's impact on SO_2 concentrations will continue into the future.



Regional air quality - San Luis Valley

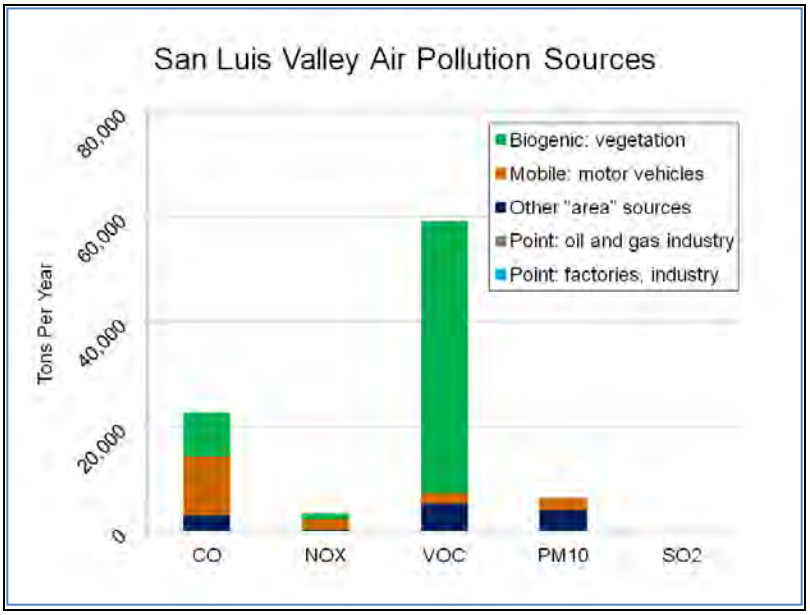
Colorado's San Luis Valley Region is in the south central portion of Colorado and includes a broad alpine valley situated between the Sangre de Cristo Mountains on the northeast and the San Juan Mountains of the Continental Divide to the west. The valley is some 71 miles wide and 122 miles long, extending 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 2010 U.S. Census Bureau estimates. Agriculture and tourism are the primary economic activities. 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.
- 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.
- Regulatory dust control measures included in supporting documentation approved by EPA on multiple occasions (under exceptional events).



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 2010 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 economic activities. All of the area complies with federal air quality standards.

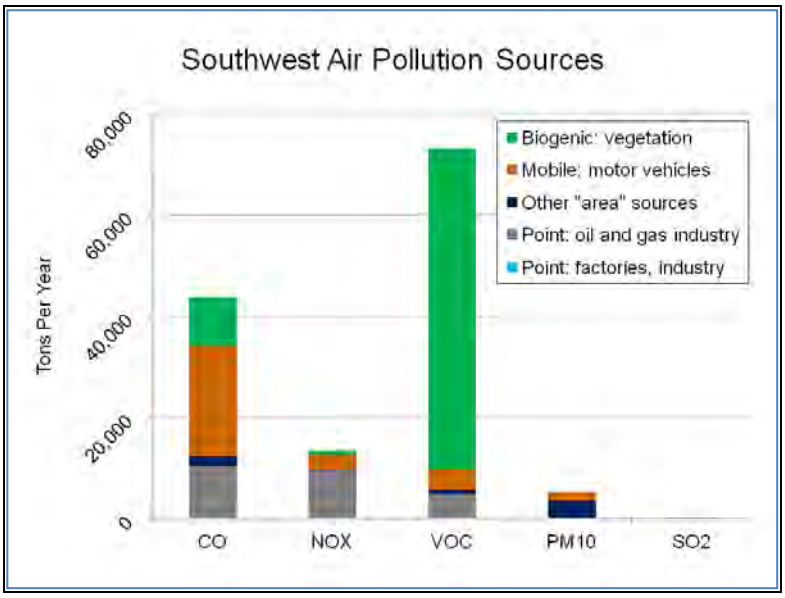
Air Pollution Sources

- 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.
- Future closure and emissions reductions from controls 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 the 2010 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.

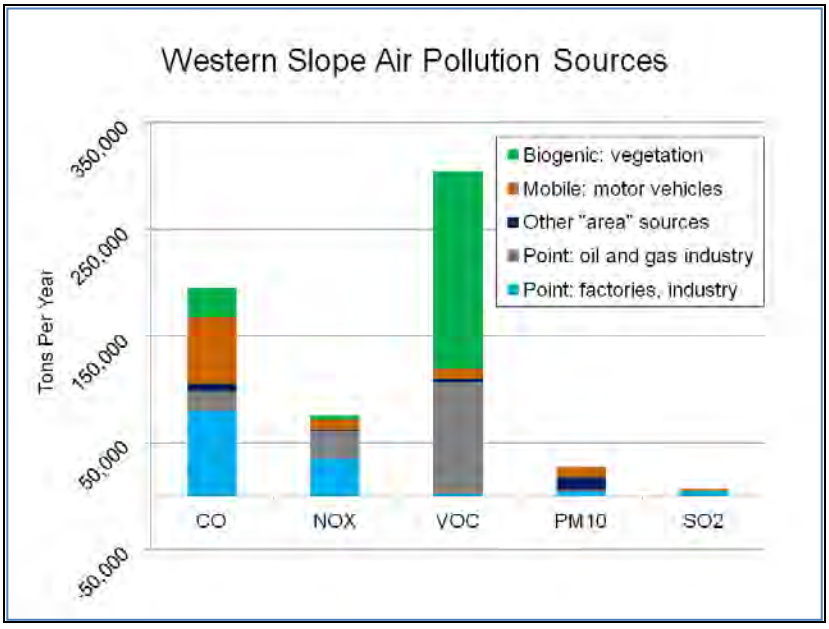
All of the Western Slope Region presently complies with federal air quality standards. However, elevated ozone levels were recorded in the Rangely area during the winters of 2010/11 and 2012/13 which resulted in violations of the 2008 ozone standard. The area has not experienced such elevated ozone concentrations since that time. The 3-year average (2014-2016) ozone concentration is below the 2008 National Ambient Air Quality Standard, so a "nonattainment designation" is not appropriate for Rangely. The Grand Junction area frequently experiences elevated wintertime $PM_{2.5}$ concentrations, though area has not violated the federal standard.

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

- Future closure and emissions reductions from controls at Nucla and Craig power plants.
- Statewide controls on oil and gas production.
- 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.
- For Rangely, oil and gas emissions control measures are being developed for production areas across the Utah state line, which are the major influence on elevated ozone concentrations in the area.



Regional air quality - Central Mountains

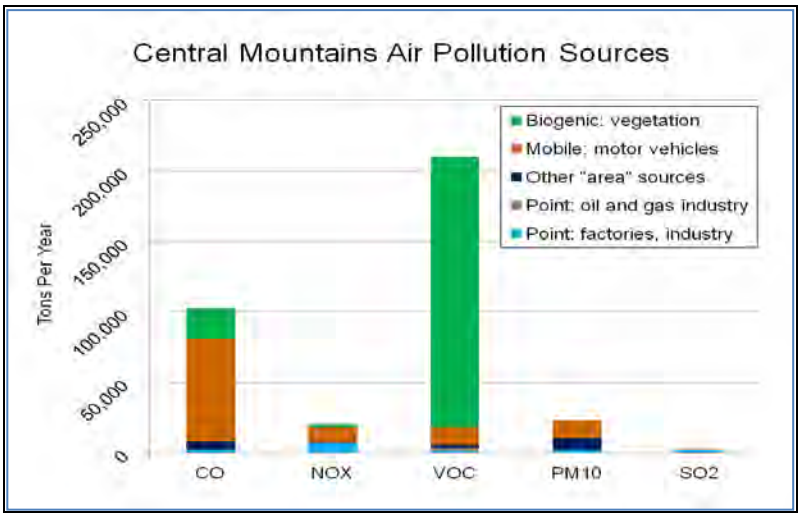
The Central Mountains Region consists of 15 counties in the central area of the state. The Continental Divide passes through much of this region. Mountains and mountain valleys are the dominant landscape. Leadville, Steamboat Springs, Cañon City, Salida, Buena Vista and Aspen represent the larger communities. The population of this region is about 256,800, according to 2010 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, along with several wilderness areas. 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 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_2 emissions, fabric filter baghouse to control particulate emissions, selective catalytic reduction at the Hayden plant by 2018 to control NOx emissions, shutdown of the Black Hills Clark Station in 2013.
- Holcim Portland Cement plant: selective non-catalytic reduction emissions for NOx reduction, wet limestone scrubbers for SO_2 reduction by 2018.
- Smoke management program for large controlled burns.
- Particulate matter 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, forecasting and data.
The Division's Technical Services Program website provides a variety of information related to air quality monitoring, forecasting, reports, modeling and emission inventories. All real-time air monitoring data are posted on an hourly basis from air monitoring sites across the state. Based on these data and predicted meteorology, air quality forecasts, alerts and advisories are posted for public notification. A variety of reports can be found as well as modeling information and information related to emissions of different pollutants in each county.

Annual Air Quality Data Report.
The Annual Air Quality Data Report provides a handy reference to the general public on air quality trends across the state and provides information on the different pollutants monitored and their potential health effects. This report is often used as a first step for data requests by the public or researchers looking to get more detailed information.

Summary of regulations

The following is a summary of the 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, public hearings, rulemaking hearings and adjudicatory 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 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.

Stationary source permit information

The following summarizes the number of permits issued and the hours billed by the Air Pollution Control Division for Construction permits and Title V permits from July 2016 - June 2017.

Actions	Construction Permits	Title V Permits
Total number of permits issued	2,669 construction permits	86 permit actions[2]
Total number of hours billed for permits	27,686 hours	10,970.52 hours[3]
The average number of hours billed per permit	10.4 hours per permit	127.56 hours per permit action[4]
The number of general permits issued	1,617 general permits	None

[1] The Air Pollution Control Division issues construction permits to authorize the construction of new facilities and the modification of existing facilities, and to allow their continued operation after they are built or modified. For the largest industrial sources, the division also issues separate operating permits (sometimes referred to as Title V permits). These operating permits are issued after a facility is built and operating and incorporate all the air quality requirements that apply to the facility, along with enhanced monitoring, recordkeeping and reporting obligations.

[2] Number of permit actions issued and includes all permit types: Initial, Renewal, Significant, Minor, and Administrative. Some permit actions are combined (e.g. Minor Mod issued along with Renewal), thus the actual number of permit issuances will be lower than this amount.

[3] This represents the total number of hours billed during this time period. T5 permits are billed on a quarterly basis, thus the hours may not be associated with a permit issued during this time period, or may include time billed for hours worked outside the time period.

[4] Total hours billed divided by total number of permits issued.

Enforcement report

The following 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 2016 - June 2017

Actions	Stationary Sources	Asbestos Unit	CFC Unit	Lead Unit
Warning Letters	72	6	0	0
Compliance Advisories	66	n/a	n/a	n/a
Notices of Violation	8	21	0	0
Notices of Noncompliance (schools only)	n/a	41	n/a	n/a
Compliance Orders	0	n/a	n/a	n/a
Compliance Orders on Consent	34	n/a	n/a	n/a
Early Settlement Agreements	49	11	0	0
AQCC Hearings	0	0	0	0

During the first half of 2016, the commission heard an appeal of a division enforcement action against two ethanol production facilities. After months of testimony and numerous hearings, the commission upheld the division's compliance orders which required the operators of the facilities to revise the permits, perform emissions testing and pay non-compliance penalties. The commission's orders were appealed by the sources to the Logan County District Court in July 2016. In April 2017, the court dismissed the case against the commission.

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.

Early Settlement Agreement (ESA): The settlement document utilized by the division and source to resolve certain informally or formally initiated enforcement actions.

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 about the government entities that address air pollution and actions individuals can take to improve air quality from the following fact sheet: Roles of government and the public.