

Air Quality Fact Sheet

the pollutants | where they come from | how they affect us

Introduction

As the lead air quality planning agency for the Denver-metropolitan area, the primary task of the Regional Air Quality Council (RAQC) is to prepare state implementation plans to ensure compliance with federal standards for the six criteria pollutants as defined by the U.S. Environmental Protection Agency (EPA). The region currently is in compliance with all of the standards, with the exception of ground-level ozone pollution. These pollutants are described in detail below along with corresponding mitigation

summertime pollutant | created when emissions “cook” under heat and sunlight

Ozone

Ground-level ozone pollution is formed when emissions from everyday items combine with other pollutants and “cook” in the heat and sunlight. Sources of such emissions include local industry, gasoline-powered vehicles and lawn equipment and household paints, stains, solvents and other daily products.

High levels of ozone pollution can cause respiratory problems for people with existing conditions such as asthma or chronic obstructive pulmonary disease (COPD). It can also affect healthy people who work or exercise outdoors, causing symptoms such as breathing difficulties, eye irritation and reduced resistance to lung infections and colds with exposure for prolonged periods.

Prior to the summer of 2007, the Denver region was in compliance with the federal standard for ozone. However, elevated concentrations of ozone recorded in the summers since 2005 pushed the region over the standard, resulting in an official nonattainment designation from the federal government. The RAQC now is charged with engaging stakeholders to develop short- and long-term plans to demonstrate future compliance.

Carbon Monoxide

primary source: motor vehicles | emissions testing program designed to reduce CO

Carbon monoxide (CO) is a colorless, odorless gas that is formed from the incomplete burning of fuel (combustion). It is emitted directly into the air from vehicle exhaust pipes and typically occurs when vehicles are first started up or when they are not properly started. The altitude in the Denver region also can impact this process because the thinner air does not allow for the proper amount of oxygen needed for combustion.

Carbon monoxide enters the lungs and inhibits the body’s ability to transport oxygen to organs and tissues. It can affect healthy individuals; however, the young, elderly and those with pre-existing health conditions, such as heart disease, are particularly susceptible to the impacts of carbon monoxide exposure.

The emissions testing program was started as a CO control strategy and has kept levels low over the years. All gasoline vehicles that were made after 1982 are required to have an enhanced emissions test before the registration can be renewed. Emission control equipment on newer vehicles has also substantially reduced carbon monoxide and other pollutant emissions. The Denver region has not violated the federal standard since 1995. Current data indicates that the monitored values of CO are approximately one-third of the standard. The current CO State Implementation Plan (SIP) suggests a continued downward trend in CO through 2020 and continued compliance with the standard.

PM10

contributer to Brown Cloud | diesel emissions and street sanding operations are major sources

Particulate matter (PM) consists of airborne particles that can be inhaled by humans. A human hair is approximately 70 micrograms in diameter, so PM2.5-10 size particles are quite small. The sources include windblown dust, unpaved roads, street sand and crushing and grinding operations. The RAQC has maintained a street sweeping program for over 15 years to help rid the streets of the on-road sand that contributes to the "Brown Cloud" in the winter.

The RAQC's Clean Air Fleets program is aimed at reducing PM emissions by retrofitting diesel vehicles to reduce the emissions they produce. In addition, the Colorado Department of Public Health and Environment (CDPHE) has operated a public outreach and education program since 1986 to help citizens become aware of actions they can take to help reduce PM in the region.

The CDPHE is retiring the old "red and blue" winter air pollution advisory system in 2009. On November 1, 2009 a new system took its place on websites and traditional media outlets region-wide. The new system features a "current air quality" bar showing real time air quality index (AQI) numbers as well as the forecasted AQI for the following day. A new "Action Day" icon takes the place of the older red advisory icon and communicates the pollutant the action day is called for. On days when no air advisory is in place and visibility is good, different icon indicating good air quality is displayed.

The region has been in compliance with PM10 since 1993 although projected increases in vehicle miles traveled cause a slow, but steady climb in PM10 emissions through 2022. Despite this projected growth, the region is expected to maintain compliance with the standard as demonstrated in the current SIP.

considered a "likely carcinogen" by the EPA | winter time woodburning is a major source

PM2.5

Fine particulate matter (PM2.5) is only 2.5 micrometers in diameter and is so small that particles can only be detected with an electron microscope. The sources of PM2.5 include any form of combustion including motor vehicles, power generation, residential wood burning, forest fires, agricultural burning and some industrial processes. Recent EPA studies suggest that PM2.5 is harmful to human health and has been labeled a "likely carcinogen." Due to the health effects associated with PM2.5, the EPA tightened the standard in 2006.

The RAQC's Clean Air Fleets program focuses on two main areas to reduce PM pollution. The two areas include outreach and education and the retrofit process. The outreach and education helps drivers and fleet managers understand best maintenance practices created to help decrease emissions such as reducing idling or running alternative devices such as engine pre-heaters. The other part of the program is the installation of retrofit equipment intended to reduce emissions coming from diesel engines. There are a variety of technologies that can be installed to decrease emissions which include particulate filters, engine preheaters, and diesel oxidation catalysts, among others. The two pieces of the program work together to help reduce the greatest amount of pollution in our region.

The Denver region never has violated the standard for PM2.5. Monitoring data indicate that readings through 2008 are below the standard and it is anticipated that the region will continue to meet the PM 2.5 standard through 2007.

Resources

RAQC.org | OzoneAware.org | RepairYourAir.org | CleanAirFleets.org