

Energy Pipeline: Latest state ozone plan nears finish line

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Air quality along Colorado's Front Range is improving and a plan showing how the state can meet a federal ozone standard is on track to be submitted to the federal government this spring.

Colorado's Ozone State Implementation Plan for the Denver Metro and Northern Front Range Nonattainment Area was approved by the nine-member Air Quality Control Commission at a hearing in November.

An approved ozone SIP is required under the Clean Air Act for regions like the northern Front Range classified as "moderate" nonattainment for ozone pollution.

MARGINAL TO MODERATE

The EPA declared the metro Front Range as a marginal non-attainment region for ozone in May 2012. Under federal rules, that decision triggered a three-year, end-of-year deadline for the state to show how it has met the 2008 standard of 75 parts per billion of ozone measured over 8 hours. All this is spelled out in the National Ambient Air Quality Standard, a body of air pollution rules and guidelines that evolved from the Clean Air Act.

Unfortunately for Colorado, a D.C. Circuit Court ruling in 2014 pushed the response deadline up to mid-July 2015, smack in the middle of the ozone measurement season and effectively costing the state a full year of ozone measurement data that showed how the Front Range squeaked in under the bar.

With the changed deadline, "we were not able to show the required number of years to maintain a marginal nonattainment designation," said Chris Colclasure, planning and programs manager at the Air Pollution Control Division. "As a result of missing the deadline, we were bumped up to moderate nonattainment. This plan shows that we can meet that standard in 2017."

The state's forecast was substantiated recently by an air issues expert.

"When numbers are plugged into the models, the state can show that it meets the standards," said Eric Waeckerlin, an attorney at David Graham & Stubbs, in Denver. "The margin is razor-thin at four of the monitors, but it meets the level for attainment."

Still unclear, he said, is what the data collected this past ozone season shows.

Ozone samples are taken at 14 air monitors along the Front Range operated by the APCD and two federally operated monitors in Rocky Mountain National Park.

Four of the ozone monitors regularly record borderline readings. They are: Chatfield Reservoir in Douglas County, the National Renewable Energy Lab in Golden, western RMNP, and the west side of Ft. Collins.

Despite the close calls, the numbers still show compliance, state reports show. A summary presented to the

Regional Air Quality Council in September stated: "a supplemental modeling analysis of data from 2009 to 2013 demonstrates attainment at the four highest monitors."

The RAQC is the state's lead air quality planning agency for Denver and the Front Range. Its 26-member board is appointed by the governor and charged with developing air quality initiatives with input from state and local governments, industry, stakeholder groups and private residents.

Emissions inventories, analysis and permitting, and implementation of the vehicle inspection and maintenance program are within the purview of the Air Pollution Control Division, a unit of the Colorado Department of Public Health and Environment. The division assists RAQC in developing the ozone plan and enforces federal air regulations.

As a result of modeling and the steps outlined in the moderate nonattainment ozone plan that was approved by AQCC in November, the Metro Denver Front Range will earn a passing grade from EPA this year, noted APCD's Colclasure.

While the RAQC report acknowledges there is a degree of uncertainty in any forecast involving the weather, it predicts that based on "ozone projections for 2017 and weight-of-evidence analyses, the control measures contained in the 2017 Denver ozone SIP will likely result in attainment of the 2008 8-hour (air quality standard) in 2017."

Meanwhile, EPA took another step in its mission to further reduce ozone levels by lowering the standard to 70 parts per billion from the 75 ppb standard enacted in 2008.

Can the Front Range meet the new standard? Indications are that it can, although Colclasure declined to speculate on how the next round of ozone planning would get it there.

"Our moderate nonattainment plan includes additional reductions from area's largest sources of emissions under what are referred to as Reasonably Available Control Technology," Colclasure said.

"We do know we are seeing a downward trend in ozone concentration in the atmosphere and that has been consistent for a number of years," he stated. "Annual averages fluctuate and that is normal, but we see a general downtrend despite a significant boom in population and more cars and more oil and gas activity."

IMPORTANT MILESTONE

Approval of the ozone SIP by the Air Quality Control Commission in November was an important milestone, Colclasure said. Next stop is a legislative review, likely early in the session. If approved there, the plan will be sent to EPA for final approval.

EPA approval of the plan helps assure Colorado will not be subject to an ozone plan developed by EPA. Specific controls and requirements of companies regulated under in the ozone plan are enforceable under federal rules.

States that do not meet National Ambient Air Quality Standards face reduction in federal funds while individual violators can be fined or denied permits.

The new 70 ppb ozone regulations, while considerably more strict, include provisions allowing states to factor in pollutants counted locally but transported from outside the nonattainment area. Also, companies can earn credits for reductions in some pollutants.

Finally, the clock does not start ticking on compliance with the new standard until a regional ozone plan is approved for attainment under the earlier standard.

THE GOOD AND THE BAD

Ozone is a pale-blue gas that forms at ground level when volatile organic compounds such as gasoline vapor react under heat from sunlight or from an electrical discharge such as lightning with an oxide of nitrogen, either nitric oxide (NO) or nitrogen dioxide (NO₂). Nitrous oxide (N₂O) is a different compound and while it is considered a greenhouse gas, is not part of ozone formation.

The resulting gas, ozone (O₃), is considered a health hazard. Its pungent, chlorine-like odor can be detected by most people at even very low concentrations and its properties as an oxidant cause irritation to respiratory tissues.

The name ozone comes from the Greek verb for smell, referring to its distinctive odor. It was discovered by a European chemist who, in 1839, recognized it as the smell left after a lightning strike. For much of the following century, ozone was considered supportive of a healthy life by naturalists who would travel to higher elevations for the perceived benefit.

Ozone is formed naturally in the upper atmosphere, between 6 to 30 miles above sea level. It is beneficial to life on earth because it filters much of the sun's UV-B rays and all UV-C rays that would otherwise cause everything from extreme sunburns and skin cancer to DNA damage in animals and plants.

Ozone depletion in the upper atmosphere by man-made chemical compounds was addressed by rules first adopted by the U.S., Canada and Norway. A ban on these chemicals was formalized as the Montreal Protocol and eventually won approval by all 197 nations around the world.

The ban on ozone-depleting chemicals is already having a positive effect. In 2003, a study by the American Geophysical Union showed that the rate of depletion of ozone in the upper atmosphere was slowing. EPA estimates the ozone layer should fully recover within 50 years.

At levels closer to the ground, ozone is considered harmful to the environment. On its own, ozone is harmful. When high concentrations combine with other compounds such as nitrogen oxides, sulfur dioxides, smoke or particulates, it forms smog, that characteristic hazy layer over cities and large towns long considered a health hazard.

Ozone is one of six compounds classified as criteria pollutants by EPA, meaning the government considers each of the six to be a health hazard and so, it sets a bar for each pollutant that cities and states are directed to meet.

REASONABLY AVAILABLE

A key factor in the APCD's plan for moderate-level ozone attainment is implementation of Reasonably Available Control Technology for emissions at the largest "point sources" in the region and of identification of other sources that might benefit from additional controls.

In letters to companies operating these point sources, the division asks them to describe the emission sources, how equipment is operated, what control technologies are used and what additional steps could further reduce emissions.

Sent to the companies last summer, the letters saw responses from both those major sources already covered by RACT and those major sources that were reviewed for additional controls.

ALREADY APPROVED

As part of a package of revisions to Colorado's "Reg 7" that was approved by AQCC in 2008 and EPA in 2011, much of the control technology already applied to oil and natural gas operations is included in the latest ozone SIP. New requirements for oil and gas include auto-igniters on all VOC combustors and that operators conduct regular site inspections according to "sound, sight and smell" guidelines.

Other Colorado regulations covering leak detection and repair (LDAR) and use of intermittent pneumatic controls are discussed in the plan but not made federally enforceable.

TRANSPORTATION BUDGETS

Another important part of the ozone plan is the motor vehicle inspection and maintenance program.

In place on the Front Range since the mid-1990s, the vehicle IM program saw significant changes in 2009, when parts of Larimer and Weld counties were added, and again in 2012 and 2014.

In the most recent revision, the Air Care Colorado program extended the new vehicle exemption to vehicles seven years old from the previous four-year exemption. Also, a pass/fail inspection for vehicles eight to 11 years old was adopted in which plug-in inspections of onboard diagnostics (OBD) replaced a run on the dynamometer. Vehicles 12 years old to 1982 models are given an IM/240 test which includes a run on the dynamometer while those 1981 and older and medium- and heavy-duty trucks are given a "tailpipe" 2-speed idle test.

Also added in 2014 is the on-highway inspection called Rapid Screen that allows vehicles to pass inspection without visiting an Air Care Colorado station.

Finally, the ozone SIP includes a budget for motor vehicle emissions. Measured in tons per day, the amount of motor vehicle emissions are forecast based on car and truck census, estimated miles traveled and fleet age. That total is rolled into the final SIP.

Highway or transit projects that count on federal funding must be reviewed for possible impact on regional emissions levels.

COOPERATION NEEDED

As state regulators look ahead to the next round of ozone compliance discussions, a degree of latitude for pollutants from sources other than those produced locally will be required, said regulatory counsel Waeckerlin.

"The state has taken all the low-hanging fruit with this latest SIP," he said. "Ozone transport and background levels are the biggest chunk. It is going to be tough to reach the next level without some cooperation from EPA."