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Central Arkansas Air Quality Issues

Of six common air pollutants (ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead), the Arkansas Department of Environmental Quality (ADEQ) routinely reports on ozone and particulate matter. Ozone acts as a protective layer high above the earth, but it can be harmful to breathe. Ground level or “bad” ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC.



Even relatively low levels of ozone can cause health effects. People with lung disease, children, older adults, and people who are active outdoors may be particularly sensitive to ozone. Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Children are also more likely than adults to have asthma.



Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground level ozone also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue.

Ozone is particularly likely to reach unhealthy levels on hot sunny days in urban environments. It is a major part of urban smog. Ozone can also be transported long distances by wind. For this reason, even rural areas can experience high ozone levels.

Particulate matter (PM) is a mixture of extremely small particles and liquid droplets made up of acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. The EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. The EPA groups particle pollution into two categories:

- Inhalable coarse particles, such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter.
- Fine particles, such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air.

Numerous scientific studies have linked exposure to particulate matter to a variety of problems, including:

- premature death in people with heart or lung disease,
- nonfatal heart attacks,
- irregular heartbeat,
- aggravated asthma,
- decreased lung function, and
- increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

Air quality is rated on a color scale ranging from green (good) to maroon (hazardous) from a health standpoint. In recent years, warnings for Central Arkansas have been issued for yellow (moderate) and orange (unhealthy for sensitive groups). These ratings can be found on the ADEQ website and at www.ozoneactiondays.org.

For the period from March 21 to June 24, 2012, 16 yellow days and 1 orange day were recorded for ozone, and 7 yellow days were recorded for particulate matter.

It is important to note that both types of air pollution have a connection with transportation and energy uses. If an area does not meet federal regulations for ozone, funding for transportation projects may be slowed, or even withheld in extreme cases. Ozone levels are of particular concern to Central Arkansans because this region has been on the verge of not meeting the current standard of 0.075 parts per million (ppm) for many years. Furthermore, the U.S. Environmental Protection Agency has proposed reducing the standard to a level within the range of 0.060-0.070 parts per million (ppm), which would make it even more likely that Central Arkansas would be in “non-attainment” of the standard.

