



# New Mexico Environment Department

PROTECTING OUR ENVIRONMENT, PRESERVING THE ENCHANTMENT

## Air Quality Bureau

### Ozone Pollution Formation

#### What causes ground-level ozone pollution?

The main pollutants that form ozone ( $O_3$ ) are oxides of nitrogen ( $NO_x$ ) and volatile organic compounds (VOC). They are considered "precursor" pollutants because they fuel the chemical reactions that form  $O_3$ .

$NO_x$  is mainly a mixture of nitric oxide (NO) and nitrogen dioxide ( $NO_2$ ). VOCs are either simple chains or rings of carbon and hydrogen that may include oxygen, nitrogen and other elements.

Without sunlight, these pollutants may not readily react. With sunlight, however, they undergo a series of photochemical reactions with oxygen ( $O_2$ ), several of which give us  $O_3$ . Although  $O_3$  pollution may be visible when mixed with smoke and other tiny particles in urban environments (sometimes called smog), it may also be a problem on clear days, even in rural areas.

#### Where do these pollutants come from?

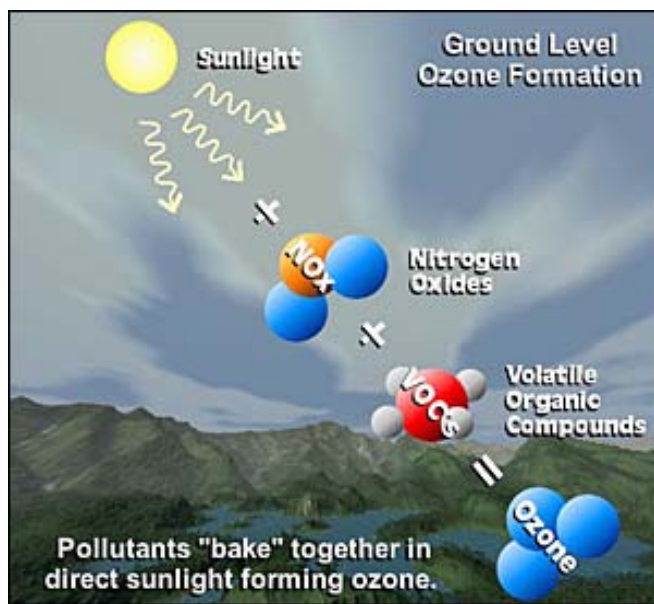
Although some of New Mexico's  $O_3$  issues are a result of local  $NO_x$  and VOC emissions, transport from other states and countries may contribute to elevated  $O_3$  levels.

$NO_x$  is primarily formed from incomplete combustion of carbon-containing materials, such as coal, oil, natural gas, and other fuels. Some industrial sources emit large quantities of  $NO_x$ ; other, smaller sources emit less individually, but collectively may be significant emitters. In addition, mobile sources (i.e., the transportation sector) also burn fossil fuels and, therefore, emit  $NO_x$ .

VOC may be emitted from oil and gas production, chemical plants, refineries, factories and numerous non-industrial sources. VOC are also released by evaporation of solvents used in many cleaners, detergents and paints. The word "volatile" (the V in VOC) means that the organic compounds readily evaporate; that's why we smell them. Fragrances in various products are common, everyday sources of VOC.

#### What can we do to help reduce ozone pollution?

The Air Quality Bureau (AQB) is undertaking the Ozone Attainment Initiative (OAI) to address sources of  $NO_x$  and VOCs in various areas of the state. AQB will use sound scientific principles and the most current emissions, monitoring, and modeling data to evaluate the cause of and solutions to high  $O_3$  levels. Eventually, the OAI will include a mix of mandatory pollutant control requirements and voluntary programs.



# Ozone Pollution Formation

## Whispurr and Muttley



## Air Detectives

An interactive adventure for those who dare to learn about ozone!

Citizens, however, can also do their part. Simple changes, like avoiding gasoline- or diesel-related activities in the middle of the day (such as lawn-mowing or filling up your tank), buying low- or no-VOC paints and products without added fragrances, and using public transportation when possible, are especially important during the hot summer months.

For other ideas, visit the Air Quality Bureau Kids' Page ([www.env.nm.gov/air-quality/kids/](http://www.env.nm.gov/air-quality/kids/)). While you're there, check out our booklet, "Whispurr and Muttley, Air Detectives" and share it with your kids, your schools, your neighbors – even your colleagues at work!

Stay informed and be part of the ozone conversation in New Mexico -- we're listening. To get the most current information, sign up for email alerts at <https://public.govdelivery.com/accounts/NMED/subscriber/new>.

### For more information:

[www.env.nm.gov/air-quality/o3-initiative/](http://www.env.nm.gov/air-quality/o3-initiative/)

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