

## **What You Should Know About Ozone**

- Ground-level ozone is a major summertime air pollutant. Ozone can aggravate asthma, reduce lung function, and lower resistance to allergens, infections, and respiratory diseases such as pneumonia.
- Children and those with pre-existing lung problems (such as asthma) are sensitive to the health effects of ozone. Even healthy adults who perform physical exercise or manual labor outdoors can experience the unhealthful effects of ozone.

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### **What is ozone?**

Ozone is a colorless gas that can be found in the air we breathe. Each molecule of ozone is composed of three atoms of oxygen, one more than the oxygen molecule that we need to breathe to sustain life. The additional oxygen atom makes ozone extremely reactive. Ozone exists naturally in the earth's upper atmosphere, the stratosphere, where it shields the earth from the sun's ultraviolet rays. However, ozone found close to the earth's surface, called ground-level ozone, is a harmful air pollutant. Ozone often combines with particles in the air to form urban smog.

### **Where does ground-level ozone come from?**

Ozone is formed by a chemical reaction between volatile organic compounds (VOCs) and oxides of nitrogen (NOX) in the presence of sunlight. Sources of VOCs and NOX include: 1) automobiles, trucks, and buses; 2) large industry and fuel-burning sources such as utilities; 3) small industry such as gas stations and print shops; 4) consumer products such as paints and cleaners; and 5) off-road engines such as aircraft, locomotives, construction equipment and lawn equipment. Ozone concentrations can reach unhealthy levels when the weather is hot and sunny with relatively light winds.

### **How does ozone affect human health?**

Even at relatively low levels, ozone may cause inflammation and irritation of the respiratory tract, particularly during physical activity. The resulting symptoms can include coughing, throat irritation, and breathing difficulty. Breathing ozone can reduce lung function, worsen asthma attacks, and aggravate other lung diseases such as emphysema and bronchitis. Ozone can increase the susceptibility of the lungs to bacterial infections, allergens, and other air pollutants. Medical studies have shown that ozone damages lung tissue and complete recovery may take several days after exposure has ended. Repeated

short-term ozone damage to children's developing lungs may lead to reduced lung function in adulthood.

### **Who is sensitive to ozone?**

Groups that are sensitive to ozone include children and adults who are active outdoors, and people with respiratory disease, such as asthma. Sensitive people who experience effects at lower ozone concentrations are likely to experience more serious effects at higher concentrations.

### **How are the standards set?**

The U.S. Environmental Protection Agency (EPA) sets national air pollution standards to protect public health. In 2008, EPA strengthened the ground-level ozone standard based on the best and most recent health research and scientific information. Orange, red, and purple levels are above the standard (worse air quality); yellow and green levels are below the standard (better air quality).

### **What can you do?**

Meteorologists issue daily ozone forecasts based on meteorological conditions and other air quality factors. Because ozone levels are a result of human activities as well as weather conditions, **you** can help reduce ozone pollution by knowing the forecast, and following the tips in the *Ozone Action Days* chart that follows. You should always follow the guidelines to protect your health. Look for the forecast (from May through September) on your local television weather report, on our website and hotline, and in some newspapers.