

# **Air Quality Index Exceedances Measured in Iowa: 2006**



*Iowa DNR  
Ambient Air Monitoring Group*

# **What is the Air Quality Index (AQI)?**

The AQI is number used to report daily air quality. The AQI is computed from air monitoring data and was created to inform of the public of health effects that can occur within a few hours or days after breathing polluted air. EPA has developed the AQI for five pollutants regulated by the Clean Air Act: ground-level ozone (O<sub>3</sub>), particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and nitrogen dioxide (NO<sub>2</sub>).

# AQI Exceedances

When air pollutant concentrations exceed an AQI of 100, EPA classifies the air quality as “Unhealthy for Sensitive Groups”. Pollutant concentrations corresponding to an AQI of 101 are listed below:

**Ozone: 85 ppb (8hr average)**

**PM2.5: 40.5 ug/m<sup>3</sup> (24hr average)**

**PM10: 155 ug/m<sup>3</sup> (24hr average)**

**SO<sub>2</sub>: 145 ppb (24hr average)**

**CO: 9.5 ppm (8hr average)**

Values over these levels are AQI exceedances. Additional AQI categories are given in the following table.

# Understanding the AQI

| <b>Air Quality Index (AQI) Values</b> | <b>Levels of Health Concern</b>       | <b>Colors</b>                          |
|---------------------------------------|---------------------------------------|--|
| <i>When the AQI is in this range:</i> | <i>...air quality conditions are:</i> | <i>...as symbolized by this color:</i> |
| 0 to 50                               | Good                                  | Green                                  |
| 51 to 100                             | Moderate                              | Yellow                                 |
| 101 to 150                            | Unhealthy for Sensitive Groups        | Orange                                 |
| 151 to 200                            | Unhealthy                             | Red                                    |
| 201 to 300                            | Very Unhealthy                        | Purple                                 |
| 301 to 500                            | Hazardous                             | Maroon                                 |

# What is Particulate Matter?

The term “particulate matter” (PM) includes both solid particles and liquid droplets (excluding water droplets) that are found in outdoor air. Particulate matter may be emitted directly into the air or form from pollutants that react in the atmosphere. Small particles tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system.

Particles of less than 10 microns in diameter are referred to as PM10.

Particles of less than 2.5 microns in diameter are referred to as PM2.5.

Sources of PM2.5 include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Sources of particles that are smaller than PM10 but larger than PM2.5 include crushing or grinding operations, and dust from paved or unpaved roads.

# How is Particulate Matter Measured ?

Iowa operates two distinct types of PM samplers. One type collects the aerosol by drawing ambient air through a filter over a 24-hour period. The filters are then returned to an analytical laboratory where they are weighed. This process provides accurate concentrations, but the data is not available to the public until the analytical work is complete, usually about a month after the sampling date. In order to provide more timely information, Iowa operates continuous samplers that measure PM10 and PM2.5 in real-time.

Some continuous PM10 samplers used in Iowa have been designated by EPA as equivalent to filter based methods. However, there are currently no continuous PM2.5 samplers designated by EPA as equivalent to filter based methods. EPA encourages use of continuous PM2.5 monitors for real-time reporting of the AQI when the data can be shown to be well correlated with the data from filter samplers. This report includes only data from Federal Reference Method (FRM) or Federal Equivalent Method (FEM) samplers.

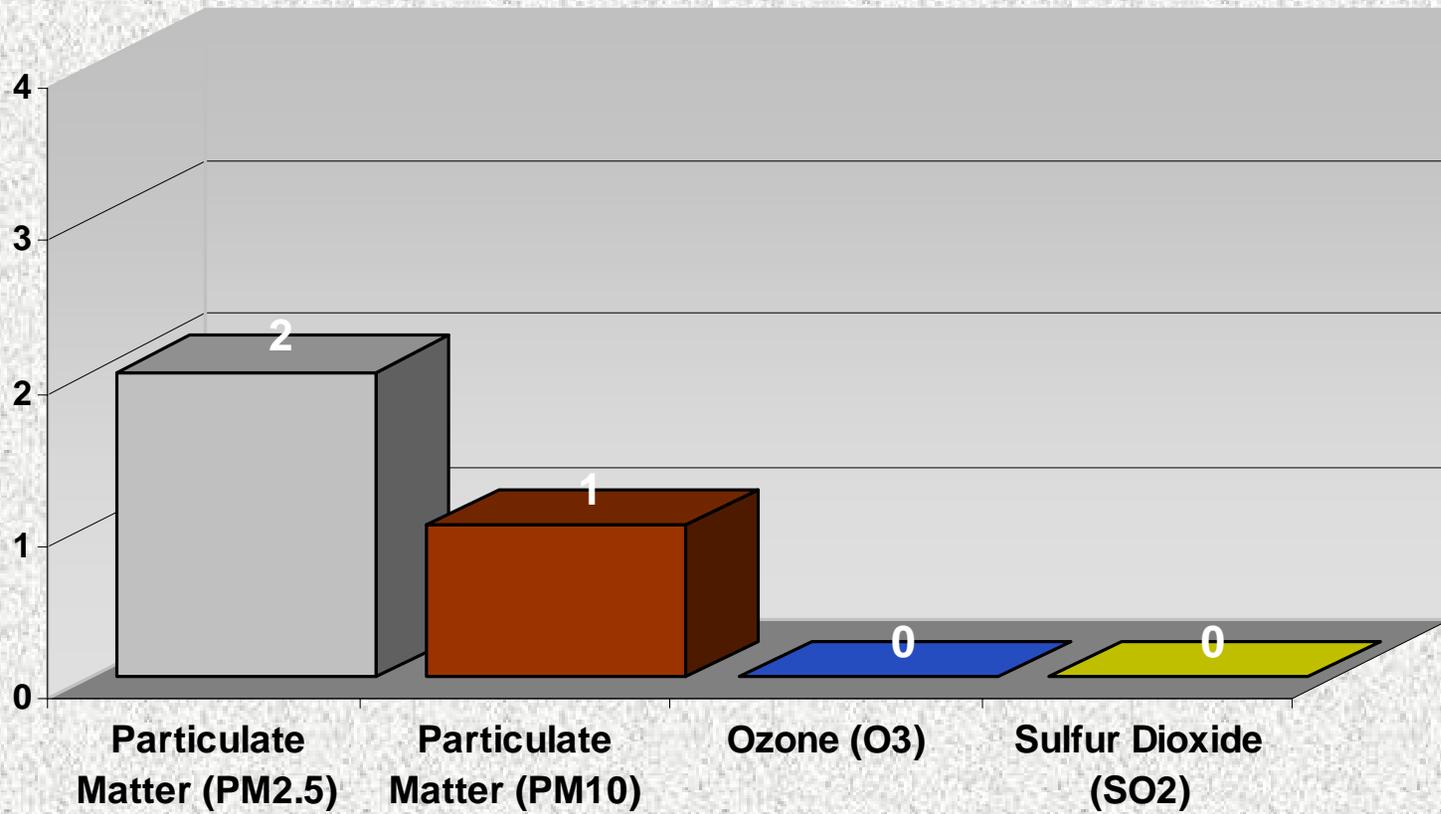
# **Fine Particulate Regulation Change**

The EPA promulgated new lower standards for fine particulate (PM<sub>2.5</sub>) that are effective on December 18, 2006.

The “old” national ambient air quality standard for PM<sub>2.5</sub> was 65 micrograms per cubic meter (ug/m<sup>3</sup>) as a 24-hour average. The new standard is 35 ug/m<sup>3</sup>. The EPA is in the process of updating the Air Quality Index to reflect the latest science on health effects of fine particulate matter.

## 2006 AQI Exceedances

| PM2.5 | PM10 | Ozone | SO2 |
|-------|------|-------|-----|
| 2     | 1    | 0     | 0   |



# 2006 Exceedance Locations

| 2006 Air Quality Index Values Over 100 |               |                |                 |       |       |     |
|--|---------------|----------------|-----------------|-------|-------|-----|
| Monitor Type                           | Site Location | Site Name      | Exceedance Date | Conc. | Units | AQI |
| PM10                                   | Buffalo       | Linwood Mining | 9/16/06         | 161   | ug/m3 | 104 |
| PM2.5                                  | Clinton       | Rainbow Park   | 11/25/06        | 50.7  | ug/m3 | 121 |
| PM2.5                                  | Clinton       | Chancy Park    | 11/25/06        | 50.9  | µg/m3 | 121 |

# Web Resources

**Real-time AQI reporting:**

*In Polk County:*

<http://www.airquality.co.polk.ia.us/>

*In Linn County:*

<http://www.air.linn.ia.us/>

*Outside Polk and Linn Counties:*

<http://www.uhl.uiowa.edu/services/environment/airquality/ambient/index.html>

*Ozone and Particulate Mapping:*

<http://airnow.gov/>

*Historical AQI values for Iowa and Other States:*

<http://www.epa.gov/air/data/>

*AQI Calculator*

<http://www.iowadnr.com/air/prof/monitor/Conc2AQI.html>