



FACTS ABOUT FINE PARTICULATE MATTER POLLUTION IN IOWA

What is fine particulate matter (PM_{2.5})?

Particulate matter consists of small pieces of matter in the air. Visible dust is one form. The most harmful particles, however, are too small to be seen without a microscope, except as smoke or haze. These particles can contain substances that (1) damage crops, forests, and other plant life; (2) change the nutrients available to aquatic life and land vegetation; (3) lead to acid rain and higher lake and stream acidity; and (4) reduce ecosystem diversity.

In addition to adverse effects to our natural environment, fine particulate matter pollution is also linked to human health problems. People exposed to fine particulate matter pollution inhale these fine particles, and the particles enter and get lodged in their lungs. Fine particulate matter pollution increases asthma, bronchitis, and heart attack rates, and it increases the risk of early death, especially for people who are exposed to it over several years.

What are the sources of fine particulate matter pollution in Iowa?

Fine particulate matter in Iowa comes from a variety of sources. Fine particulates are emitted directly into the air from combustion sources such as coal plants, motor vehicles, and open burning. In addition, fine particulate matter is formed in the air via chemical reactions. Gas pollutants, such as ammonia, sulfur dioxide, and nitrogen oxides, change chemically in the air to become either liquid or solid fine particulate matter.



When considering policies to regulate sources of fine particulate matter pollution, it's important to understand some of the terminology used by regulating agencies. When regulators refer to "Point Sources" they are talking about single, identifiable sources such as a smokestack, chimney, pipe or a factory. "Non-point sources" are areas of land or numerous small emissions sources in concentration, each of which would be difficult to monitor individually. Some examples of non-point sources include

- On-road vehicles (Diesel and gasoline exhaust, tire and brake wear, pavement wear)
- Agricultural management practices (field burning, crop tillage and fertilizers, and livestock confinements,)
- Non-road vehicles (ATVs, industrial and lawn care equipment, aircraft, motorboats, and locomotives)
- Other non-point sources (residential & industrial



Point-source industrial smokestacks along the Mississippi River at Muscatine, Iowa

heating, incinerators, and open burning).

What regulatory standards apply?

The US Clean Air Act lists fine particulate matter as one of six “criteria pollutants.” Criteria pollutants are of major concern because they are widespread, and research clearly shows their harmful environmental and health effects. The US Environmental Protection Agency (EPA) sets standards (limits) for levels of fine particulate matter. The standards are set for both acute and chronic exposures. Measurement over a 24-hour period is used to determine acute exposure. Chronic exposure is determined from a full year’s data and is averaged over a three-year period. As new information emerges from health and environmental research, the EPA may lower or raise standards.



Quarry operations, such as this Portland cement mine in Iowa, are non-point sources of fine particulate matter and dust.

Is particulate matter pollution a problem in Iowa?

The Iowa Department of Natural Resources (IDNR) uses monitoring equipment that is intended to evaluate fine particulate levels for a geographical area. Fine particulate matter pollution is gathered by county or parts of counties by the Air Quality Bureau of the IDNR, using actual monitoring data from key locations. In addition, major sources (usually industrial sites) are tested to assure that they do not exceed their permitted outputs. Several trends are apparent from statewide data, collected by the IDNR and by university researchers.

- Muscatine and Scott Counties in Iowa (Muscatine and the Quad Cities) have recently violated the 24-hour EPA standards, resulting in a regulatory status called “nonattainment.” These two counties are “in attainment” as of November 2009, but according to the Iowa DNR, at least one county is likely to be in nonattainment when monitoring data for 2009 are analyzed. Clinton County has been in violation of the standards in the past (2003-2005), and Johnson and Linn Counties levels are approaching nonattainment.
- For most of the state of Iowa, levels measured by IDNR monitoring equipment are well below the EPA standard for annual (chronic) exposure, but, according to the American Lung Association and the California Air Resources Board, the EPA standard may be set too high—that is, it may not be adequate to prevent significant impacts on human health.

Economic Impact of Fine Particulate Pollution

In addition to financial cost related to health care, fine particulate matter pollution can become a problem for the financial welfare of communities. Counties that violate EPA fine particle standards can face restrictions on new commercial and residential development if that development is likely to increase fine particle levels.

Information in this Iowa Environmental Council Fact Sheet is current as of November 30, 2009