Iowa's Air Quality Concerns and Community Land Use Planning

CLEANER AIR BETTER COMMUNITIES

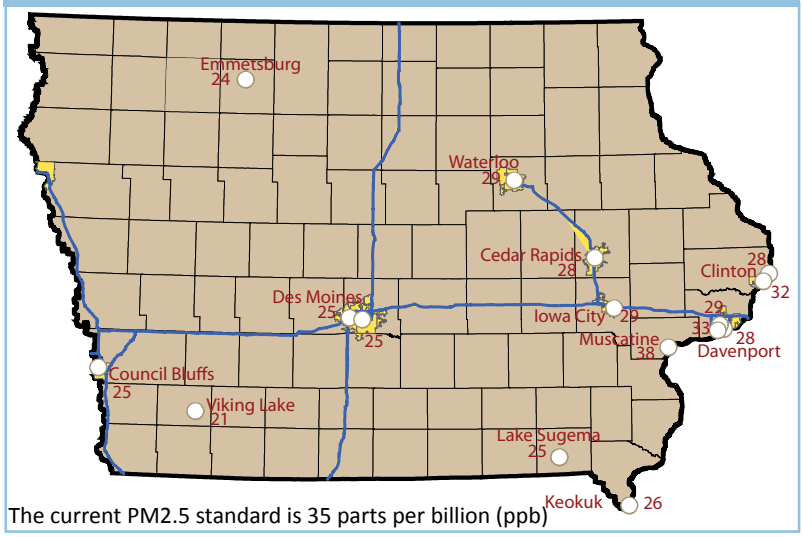
Iowa has enjoyed a reputation as a clean air state for a lot of years. However, new health studies have shown humans are more negatively impacted by air pollution levels than previously understood, and the U.S. Environmental Protection Agency's (EPA) more stringent regulations underscore that point. To protect its vulnerable populations and keep Iowa attractive as an economically viable choice for development, voluntary reduction of air pollution is an important choice for all of Iowa's citizens. The following pollutants are of most concern for Iowa's communities.

Fine Particles

Fine particles (often referred to scientifically as Particulate Matter 2.5 microns in diameter or less) harm human lungs because they bypass normal body protections and either lodge in lungs causing scarring, or enter the bloodstream and pass into all the body's organs, including the brain.

Prevailing winds, high traffic areas, electricity generation and industry are contributing to an excess of fine particles along Iowa's eastern river corridor. By June 30, 2010, Iowa's number of exceedances of the health standard was 25 percent more than the total exceedances of the previous two years' combined. Adding pressure is the EPA's review of the current standard to consider a more stringent one.

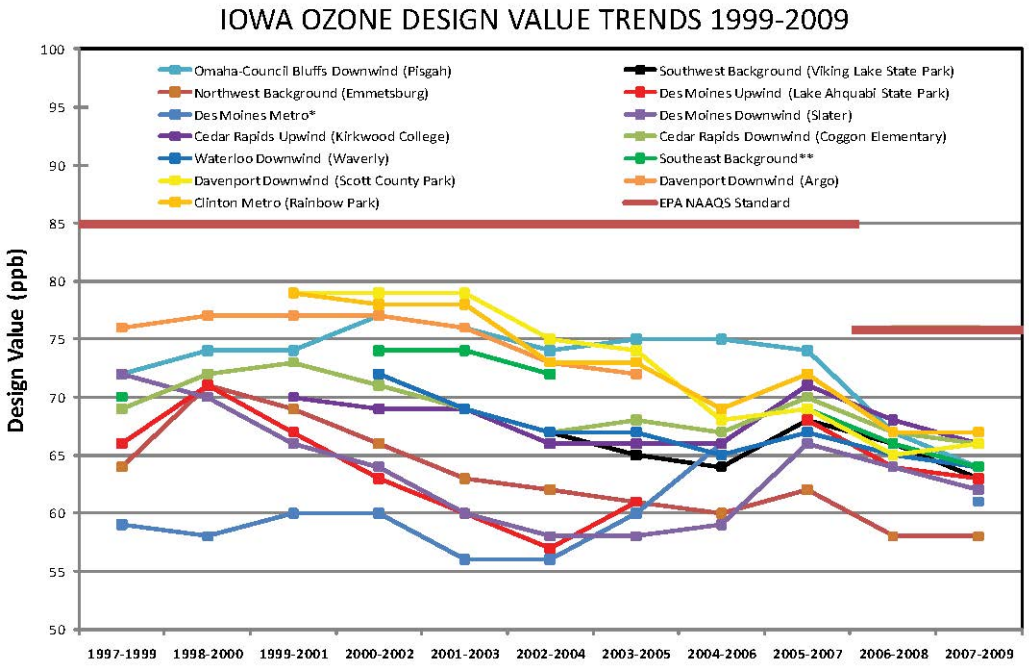
PM2.5 DESIGN VALUES FOR 2007-2009



The current PM2.5 standard is 35 parts per billion (ppb)

Ground Level Ozone

Six to 31 miles up in the atmosphere, ozone has a protective role. It shelters life on Earth from the sun's harmful ultraviolet (UV) rays which lead to increased cases of skin cancer and other harmful effects.



The EPA intends to lower the ozone health standard (NAAQS) to between 60 and 70 parts per billion (ppb) in fall 2010.

Ground level ozone is harmful to breathe and it damages crops and trees. Ozone is formed when several common airborne pollutants, called volatile organic compounds (VOCs) and nitrogen oxides (NOx) react with sunlight and heat.

Volatile organic fumes come from evaporation of gasoline, paint, solvents, consumer products, varnishes and industry chemicals. Nitrogen oxides come from high-temperature combustion found in exhaust from auto and truck engines, boilers, utilities and other sources. VOCs and NOx are often referred to as "ozone precursors."

Economic Consequences

There are serious economic consequences for areas that exceed the EPA health standards. Areas with worse pollution need to take stronger measures to reduce pollution. Baseline activities require new pollution controls. Additional reporting and paperwork is required. New or expanding businesses would have to offset their additional emissions by reducing emissions in the area. For example, they could buy emission control equipment for another business.

Another consequence is transportation projects must confirm with the area's air pollution reduction plans. Projects that do not follow the reduction strategies are not allowed to proceed.

Air Toxics

Toxic air pollutants are pollutants known or suspected to cause cancer, other serious health effects, or adverse environmental effects. Examples include benzene, found in gasoline; perchloroethylene, emitted from some dry cleaning facilities; and methylene chloride, used as a solvent and paint stripper by a number of industries. Examples of other air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

Businesses that may expose citizens to toxic air pollutants should have special siting requirements to reduce citizens' health risks.

Land Use Planning

Communities should also consider patterns of air pollution dispersion as well as its formation. Prevailing winds, area meteorological conditions, terrain, and the concentration of pollution sources impact dispersion. Additional considerations include the current background air pollution, historic land use patterns and transportation corridors.

Using planning and zoning authority, set back and landscaping requirements, permit issuance and ordinances along with stakeholder collaboration will help communities stay within EPA's health standards and support plans for their economic growth.

What Would You Do?

1 A developer plans a low income housing near an industrial park. The advantages are a nearby large gas station/convenience store that includes DVD rentals and fast food. There is open space for a playground and occupants will be close enough to walk or ride bikes to work.

Factors to Consider

What kinds and quantities of emissions do the industries release and how high are they released into the air? Will the housing be upwind or downwind of industries? How close is the housing to the large gas station, which will emit benzene (a carcinogen)? Is the housing ground level or high rise? What kinds of controls or provisions have the industries implemented to improve air quality at ground level? Do natural topographical features exist that help or hinder air quality? How much traffic will the area be exposed to? This situation has potential for cumulative air pollution impacts that could increase residents' health care needs.

Upwind location, proper setbacks, an idling reduction ordinance, industrial traffic directed away from residences, and a good landscaping plan with the playground planned inside a courtyard may make this project plausible.

2 A mixed use project is planned: small commercial areas with residential units above and a detached medical building. This encourages people to live within walking distance of needed services, which will cut down on vehicle traffic.

Factors to Consider

This is potentially an excellent project. Check how medical wastes will be handled. Make sure left turn lanes and signals will be available during construction, and that landscaping and set back requirements encourage tree planting to help cool buildings, pavement and reduce need for energy use.

3 The merging of school districts results in the decision to build a new high school next to the east-west Interstate and a north-south highway interchange, a place central and convenient for everyone.

Factors to Consider

There is potential for a great deal of VOCs and NOx from heavy motor vehicle traffic and at least four carcinogenic toxic air contaminants: diesel exhaust, fine particles, benzene and 1,3-butadiene from passenger cars. Dust from road traffic is also a health hazard.

A protected site with a natural vegetative barrier upwind from high volume traffic is a better alternative.