FACT SHEET

Particulate Matter

What is particulate matter?

Particulate matter is a complex mixture of very tiny solid or liquid particles, composed of chemicals, soot, and dust. Because only very small particles can be inhaled into the lungs, health standards for the quality of ambient air are based on the mass concentration of "inhalable particles", defined to include microscopic, invisible particles that are 10 microns (millionths of a meter) or less in diameter called PM_{10}. The smallest of these inhalable particles, those 2.5 microns and smaller, are called $PM_{2.5}$.

Where does particulate matter come from?

In San Diego, most fine particles ($PM_{2.5}$) are formed in the air by a chemical reaction since the county does not have the woodburning or coal use that contributes to particulate pollution. Fine particulate matter is predominantly from combustion sources like vehicles, diesel engines and industrial facilities. Emissions of organic gases, nitrogen oxides (NOx), sulfur oxides (SOx) and ammonia react in the atmosphere, forming the tiny particles. These particles can remain suspended in the air for long periods and can travel great distances.

Coarser particles are directly emitted from activities that disturb the soil including travel on roads and construction, mining, or agricultural operations. Other sources include windblown dust, pollen, salts, brake dust and tire wear.

Why be concerned about particle pollution?

Particles affect our health. Particles 10 microns or less are capable of bypassing the body's natural defenses in the nose and throat and entering the lungs. When inhaled, particles can increase the number and severity of asthma attacks and cause or aggravate bronchitis and other lung diseases. Community health studies also link particle exposure to the premature death of people who already have heart and lung disease, especially the elderly.

Particles also affect our view. They absorb and scatter light. Airborne particles are a primary component of the haze that obscures visibility in our cities, rural communities, and scenic parks.

Are the health effects of particulate matter related to the size of the particle?

Yes. Depending on their size, these particles affect different parts of the respiratory tract. Particles 2.5 to 10 microns tend to collect in the upper portion of the respiratory system. Those particles 2.5 microns and smaller are so tiny they can penetrate deeper into the lungs and damage lung tissue.

Can you relate particle size to something I can understand?

Ten microns is about one-seventh the diameter of a human hair. Particles 2.5 microns are roughly one twenty-eighth the diameter of a human hair.

What are the standards for particulate matter?

Federal air quality standards for fine particles ($PM_{2.5}$) were established by the U.S. Environmental Protection Agency in July 1997. Previously, the federal particulate standards were revised in 1987 from measuring total suspended particulates to a standard that measures only inhalable particles of 10 microns or less (PM_{10}). The PM_{10} standard is still in effect.

In 1984, California adopted its own standard for the full range of inhalable particles (PM_{10}) which includes $PM_{2.5}$ as a component.

Air Quality Standards

(micrograms per cubic meter)

	PM_{10}	$PM_{2.5}$
24-hour		
Federal	150	65
State	50	---
Annual		
Federal	50	15
State	30	---