



# At a Glance

*Catalyst for Improving the Environment*

## Why We Did This Review

We sought to determine whether EPA's PM<sub>2.5</sub> speciation air monitoring network is sufficient to (a) adequately identify sources of fine particulate matter (PM<sub>2.5</sub>), and (b) facilitate the development of effective control strategies to reduce PM<sub>2.5</sub> to safe levels. Determining the chemical make-up of a particle – known as speciation – is largely accomplished through data generated by this network.

## Background

Airborne particulate matter 2.5 microns or less in size (PM<sub>2.5</sub>) is comprised of a complex mixture of particles composed of sulfate, nitrate, ammonium, organic carbon, elemental carbon, and organic and inorganic compounds. Tens of thousands of premature deaths yearly are associated with exposure to excess levels of PM<sub>2.5</sub>. By 2010, EPA estimates that compliance with PM<sub>2.5</sub> emission control strategies will cost industry more than \$37 billion annually. EPA's speciation monitoring network is a critical component in the development of these control strategies.

For further information, contact our Office of Congressional and Public Liaison at (202) 566-2391.

To view the full report, click on the following link:  
[www.epa.gov/oig/reports/2005/20050207-2005-P-00004](http://www.epa.gov/oig/reports/2005/20050207-2005-P-00004)

## ***EPA Needs to Direct More Attention, Efforts, and Funding to Enhance Its Speciation Monitoring Program for Measuring Fine Particulate Matter***

### What We Found

EPA has made substantial progress in establishing a speciation monitoring network to facilitate the development of PM<sub>2.5</sub> control strategies, but still faces a number of challenges in ensuring that the controls are implemented at the right sources. The development of control strategies is best approached through collaborative processes that use emissions inventories, ambient monitoring data, and air quality modeling. Although the speciation network provides information for understanding the make-up and origin of PM<sub>2.5</sub>, the network does not fully assist in providing the data for EPA and States to identify or quantify the chemical make-up of PM<sub>2.5</sub> particles, reliably trace particles back to their source, or account for chemical changes that occur after particles are released into the atmosphere. Speciation data are available to begin working on control strategies, and EPA and the States are beginning the development of control strategies; however, increased monitoring efforts are needed.

Under the Clean Air Act, States with PM<sub>2.5</sub> nonattainment areas have until February 2008 to develop control strategies for reducing PM<sub>2.5</sub>, and an additional 2 years to reach attainment with the PM<sub>2.5</sub> standard. Also, with justification, the Act allows EPA to grant a State an extension of up to 5 years to reach full attainment. Data from EPA's speciation network will be vital to ensuring that pollution controls are implemented at the right sources. Otherwise, some facilities may install unneeded controls, while some needed controls may go uninstalled; ultimately, compliance may be further delayed and more costly.

Agency officials acknowledge that improved speciation data will be needed for EPA to overcome the uncertainties associated with PM<sub>2.5</sub> particle origin. In 2004, EPA budgeted over \$43 million for PM<sub>2.5</sub> monitoring, with about \$16.4 million for operation of the existing speciation monitoring network. However, only about \$800,000 was budgeted for improving its capability to address uncertainties with PM<sub>2.5</sub> particle origin. According to manufacturers and some Agency officials we contacted, increased partnering between EPA and monitor manufacturers may be needed if advanced speciation monitors are to be developed in time to help agencies develop air pollution control strategies that ensure controls are implemented at the right sources.

### What We Recommend

We recommend that EPA increase its research on technologies that can more fully identify the chemical make-up of PM<sub>2.5</sub>, account for the atmospheric impacts on PM<sub>2.5</sub>, and assay the resultant changes that occur to the composition of the particle. This includes increasing opportunities for cooperation with the private sector to develop improved continuous speciation monitors. In its response to the draft report, EPA disagreed with certain issues; however, the Agency stated that the recommendations generally align with their current improvement efforts.