

# LEAD (Pb)

## NATURE AND SOURCES

Automotive sources are no longer the major contributors of lead emissions to the atmosphere. As a result of EPA's regulatory efforts to reduce the content of lead in gasoline, lead emissions from the automotive sector have greatly declined over the past few decades. Today, industrial processes and combustion of leaded fuel associated with some small planes (piston-engine aircraft) are the major sources of lead emissions to the atmosphere.

## HEALTH AND ENVIRONMENTAL EFFECTS

People can be exposed to lead by inhaling it from the air or by ingesting lead in contaminated drinking water, lead-contaminated food, or lead-contaminated soil and dust. Lead-based paint remains a major exposure pathway in old houses. Depending on the level of exposure, lead can adversely affect the nervous system, kidneys, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. The lead effects of greatest concern from current exposures are neurological effects in children. Infants and young children are especially sensitive to even low levels of lead, which may contribute to

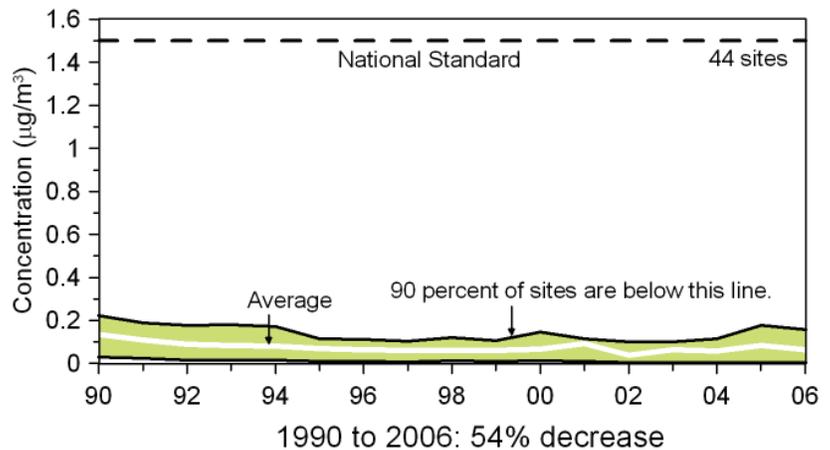
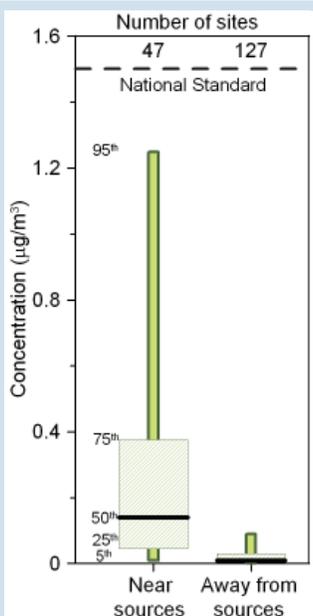


Figure 29. National lead air quality trend, 1990-2006 (maximum quarterly average).

behavioral problems, learning deficits, and lower intelligence quotients.

Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, discharge of waste streams to water bodies, mining, and erosion. Ecosystems near point sources of lead demonstrate a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

## New Information on Lead Sources



Large reductions in long-term lead emissions from transportation sources have changed the nature of the lead problem in the United States. Unlike the early 1980s, most of the highest lead concentrations in 2006 are near lead emissions point sources. These point sources include metals processors, battery manufacturers, waste incinerators, mining operations, military installations, and facilities with large boilers (e.g., utility, industrial, and institutional).

Data for all lead monitoring sites with complete data in 2006 shows lead concentrations near point sources are significantly higher than those not near point sources, as shown. The typical concentration near a source is approximately 10 times the typical concentration for sites that are not near a source.

Note: Concentrations shown are maximum quarterly averages using sites with complete data in 2006.

## TRENDS IN LEAD CONCENTRATIONS

Because of the phase-out of leaded gasoline, lead concentrations declined sharply during the 1980s and early 1990s. Between 1980 and 2006, concentrations of lead in the air decreased 95 percent, while emissions of lead decreased 97 percent. From 1990 to 2006, lead concentrations remained low, as shown in Figure 29. In 2006, only two sites had concentrations above the level of the standard ( $1.5 \mu\text{g}/\text{m}^3$ ); both are associated with lead smelting operations in Herculaneum, Mo.