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## World Trade Center Plume Was Highly Toxic

### Air-Quality Experts: World Trade Center Debris Gave off Toxic Pollutants

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Sept. 10, 2003 -- Breathing dust wasn't the only risk that people in the immediate area of the collapsed World Trade Center encountered. As the rubble smoldered, toxic particles created by the fire rose into the air, and into the lungs of many.

For several months after Sept. 11, 2001, a team of researchers led by Thomas Cahill, PhD, of the University of California, Davis, sampled the air from atop of a tall building about one mile north of Ground Zero. Cahill presented his findings today at the American Chemical Society annual meeting in New York.

"We're seeing stuff that's very disturbing," he tells WebMD.

The air samples contained very fine particles of poisonous metals, sulfuric acid, and other pollutants that weren't found in the dust that blanketed the area. "We really have two situations," Cahill says. First there was the dust storm that engulfed lower Manhattan. After the dust settled, a fire burned for three months.

The vile plume that rose from the site was much like the smoke from a municipal trash incinerator, Cahill says.

Tons of computers, furniture, carpet, and everything else the 110-story towers contained slowly cooked together in the buried fire -- which wasn't very hot because it was starved of oxygen. But the presence of great amounts of chlorine in the burning materials lowered the temperature at which the toxic particles could be released.

Without chlorine present, toxic particles are released only at very high temperatures. But with chlorine in the mix, the particles can form at a lower temperature.

Fortunately for most New Yorkers, fumes from the fire didn't often drift down among the city's canyon-like streets. "Most of the time in New York City, the plume was above your head," Cahill says.

On a few days in October, however, weather conditions pushed the plume down to the ground. On October 3, 4, and 5, levels of poisonous particles in the city were particularly high.

Workers on the debris pile who weren't wearing respirators would have had the worst exposure to airborne toxins, Cahill says.

It is still unclear just how serious the consequences will be for them. "We don't know if there are going to be any lifetime effects," says Paul Liroy, PhD, a researcher at Rutgers University's Environmental and Occupational Health Sciences Institute.

Their health will have to be monitored for years, and programs have been started to do that; although no one is downplaying the risks they faced.

The particles that Cahill found not only damage the lungs, but they can also cause heart disease. Cancer is a possibility, too. "There were some carcinogens in there -- no doubt about it," Liroy says.

Having breathed fumes from the fire probably will not be as much of a worry for millions of New Yorkers who were further away from the site. Other than those working at Ground Zero, "there was not any one group of people who were exposed all the time," Liroy says.

But the picture isn't whole. No one was prepared for what happened that day. Air quality measurements weren't taken right away, and there was no coordinated effort to sample the air throughout the city. "Everyone was doing work at different times," Lioy says.

Cahill's findings were criticized by some scientists at the meeting for not taking the city's normal pollution levels into account. The air in New York is never pristine.

Background pollution and diesel fumes from equipment used in the cleanup could have added to the particle levels Cahill measured. "The major impact was the World Trade Center," Erick Swartz of the Environmental Protection Agency tells WebMD. But he says the other factors can't be ignored. "It's a mixture of all three," he says.

Cahill defends his findings, saying that the unusually high readings coincided with times when the plume was blown in the direction of his sensors. What's more, he says, pollution levels were not elevated in the outer borough of Staten Island at those times.

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Sources: American Chemical Society annual meeting, New York, Sept. 7-11, 2003. Thomas Cahill, PhD, professor emeritus of physics and atmospheric sciences, University of California, Davis. Paul Lioy, PhD, director, Environmental and Occupational Health Sciences Institute, Exposure Measurement and Assessment Division. Erick Swartz, U.S. Environmental Protection Agency.

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