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Safety Questions Remain About Air at Ground Zero

By KIRK JOHNSON

Air quality in Lower Manhattan has gradually improved since the early days after the World Trade Center disaster last month, when a gritty, acrid residue of combustion and dust hung over parts of the city like a shroud. But at certain times, under certain conditions — usually for brief periods — the bad air still returns.

Most health experts are not terribly alarmed about the effect of these episodes on a generally healthy population. Although many people remain concerned about the smells and dust that can make eyes and throats burn, and anxious that conflicting information has left them at risk, health experts say that because the spikes do not last long and often occur in the middle of the night when few residents or office workers are on the streets, most people need not worry. Workers at the cleanup site itself, of course, are still advised to wear respiratory protection.

But the deeper questions that scientists and physicians are posing — where exactly the fouled air is coming from and what fosters its resurgence, often in the darkest hours before dawn — constitute something of a downtown mystery.

The prime suspects include, logically enough, the smoke from the still-smoldering ruins, but also the many diesel vehicles operating in and around the site. The peculiarities of the weather in the city in mid-to-late fall add yet another wrinkle of complexity, researchers say.

"This is an unusual case," said Dr. George D. Thurston, an associate professor of environmental medicine at New York University School of Medicine, which has set up its own air monitoring device close to ground zero and alongside other monitors from the federal government and other private institutions.

Currently, the monitors tracking pollution around the World Trade Center site are not able to distinguish how much of the so-called pollution particulates are being generated by the fire in the depths of the ruins, which cleanup crews have not yet reached, and the heavy diesel machinery at the surface, much of which operates around the clock.

But there are hints and clues. Sulfates taken from the air samples, for instance, are probably from diesel combustion, while other components, like chlorine, could at least in part be coming from burning plastics somewhere down in the rubble, Dr. Thur-

ston said. The fire, which has burned more or less constantly since Sept. 11, is fed by the huge compilation of buried office material and the added oxygen that becomes available when some of the ruins are removed.

Regardless of the mix, he and other experts say that atmospheric conditions in late fall, which tend to keep a lid on air circulation in the city, could make nighttime air pollution worse, or at least more frequent, in coming weeks. One of the highest

one-hour readings in recent weeks for fine particulate matter in the Trade Center area was recorded at 2 a.m. last Friday, for example, by a monitor at Pace University.

Dr. Thurston, in particular, has argued that watching the weather forecast should become a part of the cleanup operation, and that administrators should consider suspending work at times when unfavorable air patterns emerge. Other air-quality groups, like the American Lung Association, have argued that the cleanup project itself should be made cleaner through technologies and fuels that would reduce diesel emissions.

Officials at the Federal Environmental Protection Agency say the issues of particulate pollution and Lower Manhattan weather patterns are not that simple. They say that federal health standards for fine particulates have never been exceeded at any of the agency's monitors for any period averaged over 24 hours since Sept. 11, and that no health standards have been established for short-term surges because the harmful health effects of short exposures have not been proven.

Some studies, though, indicate that some people with heart disease and other problems could be affected by even brief pollution spikes.

And so the federal officials say they are looking into the question of the nighttime pattern raised by Dr. Thurston. And they are also considering using more sophisticated air monitoring devices in the neighborhoods around the World Trade Center site that could help distinguish particulate sources.

The chief of the E.P.A.'s Air Programs Branch in New York, Raymond Werner, said that pollution generated at ground level is not the only thing that can account for elevated particulate counts. Some increases have also occurred during the recent warm days, he said, when sunlight has reacted photochemically with gases in the atmosphere to produce more particles.

Meteorologists say that in general, New York's air is at its worst in the fall. The prevailing winds of summer, which tend to blow in from the Atlantic Ocean, have quieted, and the prevailing winds of winter, which bring storms from the west, have not yet begun.

Another variable is that New York City is big enough to generate its own unique weather, once again often to the detriment of its air. Robert Bornstein, a professor of meteorology at San Jose State University, who has extensively studied New York City's weather patterns, said that as colder weather settles on the region, the heat generated by thousands of building furnaces creates what is called a heat island effect, which draws in colder air from areas around the city.

"Pollution gets drawn toward the center," he said.

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