OROVILLE, Calif. - People realized they were in for trouble when an early-morning explosion shook the Koppers Co. wood-treatment plant south of Oroville, pushing up a tower of acrid black smoke that burned their lungs and blistered their skin.

When small but unhealthy traces of the toxic material dioxin turned up a few months later in locally produced eggs, chickens and beef, they realized the problem was not going to go away.

Nothing, however, matched the outcry last week, after a 42-year-old woman active in a citizens’ clean-up campaign collapsed and died unexpectedly at the door of Oroville Hospital's emergency room.

State and county medical officials discount the possibility that Elaine Brooks' death, apparently caused by a blood clot in a lung, is related to the contamination of her family's small ranch south of the city.

Those same doctors, however, know little about the mysterious, widespread dioxin contamination of the area - and about the effects of dioxin itself, a toxin found in Agent Orange and blamed by many Vietnam veterans for a variety of disorders, from cancer to birth defects. So the physicians’ assurances only fueled the controversy they sought to quell.

Everyone knows there are poisons on the ground in Oroville - and poisons in the earth, poisons in the animals and poisons in the produce.

But no one is sure how the poisons got there, how dangerous they are or even how widespread the contamination is. Scientists who tried to map out the extent of the pollution ran out of both patience and money before they ran out of dioxin.

``Everywhere we've looked, we've found it,’’ said Dr. Lynn Goldman, the state Department of Health Services epidemiologist in charge of the investigation. ``But like so many other aspects of the case, we don't know how to interpret that.''

The story has many beginnings, from the conversion of the plant in the late 1940s from a lumber mill into a wood-treatment factory, to a 1963 fire that may have been the factory's first major airborne dioxin release, to the discovery in the early 1980s that the plant had so badly polluted local well water that it qualified for the federal government's Superfund list of the country's worst toxic-waste problems.

The most recent beginning, though, was the April 6, 1987, fire that led to the discovery of what the state health department describes as unusually high and potentially unhealthy levels of dioxins dispersed widely in the local environment.

Oroville is a logging and farm city of 11,000 in north-central California that considers itself a mecca for lovers of the outdoors. Boosters proudly note that the city sits between Sacramento Valley wetlands and northern Sierra forests, with Lake Oroville for a swimming hole.

``This (contamination) is not the kind of thing people expect when they move to the country, buy a house and decide they're going to grow all of their food organically and live off the land,’’ said Goldman, the state's medical researcher. ``All of a sudden, they find that they're dealing with a contamination problem none of us really understand.'’

The Koppers Co. fire began when a worker spilled a mixture of liquid butane and pentachlorophenol, a wood preservative commonly referred to as ``penta.'’’ The mixture was used to pressure-treat telephone poles, enabling them to resist rot and insects without a coat of gooey oil or creosote.

The butane exploded in flames, slightly injuring one worker and buckling open a nearby storage silo filled with dry penta.

The preservative, which normally contains dioxin as a manufacturing byproduct, also produces dioxin when it burns.

State health officials came to the area immediately to assess the impact of the fire, questioning plant managers and local residents, and collecting eggs for later analysis. For some reason, the results of that analysis were not released until March of this year. They showed unusually high levels of dioxins in the yolks - 9.8 parts per trillion, nearly 100 times the barely measurable level in eggs bought at a San Francisco Bay area supermarket.

Subsequent tests, in March and April of this year, showed even higher levels - up to 30 parts per trillion in eggs, 39 in beef, and up to 358 in the fatty tissues of the chickens running around Ruth and Herb Lightle's backyard.
Blood samples were taken from the Lightles and their three children in April, but the state lacks laboratory resources and money to conduct the tests needed to analyze them. Such tests cost $1,500 apiece, Goldman said.

Soil in the area also was tainted, tests showed. Dirt samples around the Lightles' house consistently registered in the 55-parts-per-trillion range, while a vegetable garden next door, at the Brookses' home, hit 350.

Goldman said those levels are much higher than she would have expected to have found in a semi-rural area such as Oroville. Beyond that, she and others are reluctant to speculate.

That reluctance frightens some local residents as much as bad news.
``The way she (Goldman) is talking, it could be months or years before they have answers,`` said Ruth Lightle. ``In the meantime, we are still breathing it and eating it. I don't want my kids exposed to it.``

She said her children were ``scared to death`` to go to sleep the night Elaine Brooks died. ``They were sure they were going to die in their sleep.``

The Koppers fire initially was the suspected source of the dioxins, but state scientists noted that the area of heavy ground contamination was not in the path of the smoke plume. Also, the liver of a calf butchered and frozen in a homeowner's freezer two years before the fire showed the same pattern and levels of contamination as the liver of a calf slaughtered a year after the blaze.

``That tended to throw out the fire as the sole source of this problem,`` Goldman said. Instead, she said, the fire likely is one of several dioxin sources. Others include the plant's earlier fire, air emissions from the factory and the use of penta-tainted sawdust and ash from the plant as soil additives. Dioxins also may come from the use of penta as an over-the-counter weed-killer in the 1960s and '70s, or the use of treated fence posts or railroad ties.

That view was seconded by Koppers' plant engineer, Steve Smith, who thinks the intensely hot fire may have burned up as much dioxin as it created.
``I don't disagree that we are a potential source of dioxin,`` he said, ``but I just don't think we were the source of dioxin.``

Goldman is skeptical of potential sources other than pentachlorophenol, such as the local practice of burning pesticide-treated rice stubble, because she said the ``chemical fingerprints`` of the dioxins indicate they came from the wood preservative.

She also has ruled out contaminated animal feed as a potential source.
``Given that the stuff is in cattle and chickens, we figure it has to be something fairly generalized - either air, water or soil,`` she said. ``That is all they have in common.``

Goldman stressed that the state is committed to trying to find the source of dioxins and mitigating their danger. But, she conceded, the source may never be pinned down, and no one is certain how dangerous the material really is.

The best estimate, she said, is that the eggs with the 9.8-parts-per-trillion level should be expected to result in one additional cancer out of every 1,000 people eating them. In other words, instead of 250 to 300 cancer cases that statistics would normally predict for a group that size, there would be 251 to 301. That is low, but still a higher risk than what usually is acceptable in state and federal regulations.

The risk was discounted further by other medical experts, such as Michael Kamrin, a natural sciences professor at Michigan State University's Center for Environmental Toxicology and editor of the book Dioxins in the Environment.
``In terms of human evidence,`` he said, ``there is little evidence that low-level, short-term exposure causes serious problems.``

He conceded that if given the choice between tainted and untainted meat, ``I obviously would choose the meat without dioxins.``
``But,`` he added, ``I don't really see it (the Oroville situation) as a real serious health problem.``

Uncertainty permeates debates about the dangers of dioxins, a class of several isomers so idiosyncratic that a dose capable of killing a guinea pig is only 0.02 percent of the lethal dose for a hamster.

Goldman said people who eat tainted eggs probably run a greater risk of heart disease than dioxin-induced liver cancer because of the eggs' naturally high cholesterol level. But, she added, ``they are at risk (from dioxins) in that the levels we're finding in eggs are unacceptable for consumption.``

That is not news to members of the community, particularly people living on small ranches south of the plant, which is just south of the city. Before the toxic fire, they had already been fighting Koppers over its pollution of local ground water supplies.
What's sad about the fire, said Kaylynn Newhart, who lives a quarter-mile from the plant, is that it crushed every last hope we had that things were returning to normal after the shock of learning that local water supplies were adulterated and may have been adulterated for decades. After Koppers said it had discovered the contamination in 1983 - 10 years after state water officials confirmed the presence of pentachlorophenol in 10 local wells - the company paid to have affected residents connected to the municipal water system for domestic use. Irrigation water still is pumped from tainted wells. The company also agreed to pick up motel costs for people evacuated from their homes during the fire, and puts out a newsletter to residents on its various cleanup efforts. Koppers has not, however, told local people what to do with the cattle they raise, the chickens they keep or the produce they grow. Meanwhile, state officials offer only sketchy advice - essentially, shun the livers, trim the fat and take your chances.

``I have two freezers of beef in there,`` said Herb Lightle, gesturing toward his garage, where he keeps a dressed heifer he said he had butchered to supply the state with beef samples for analysis. ``They already told us it was so high (the chemical level) we can't eat it. But they also said we can't sell it or even give it away.``

``There is a man down the road who grows sweet potatoes,`` said Ruth Lightle. ``He gave some of them to his neighbors, but they don't know whether to eat them.``

``We were going to retire here and raise some calves to supplement our income,`` said Norma Prince, one of several local residents who have sued Koppers. ``But we had to get rid of our calves. We had to get rid of our hogs. Our chickens wobbled around and died. Our cats became so paralyzed in their hindquarters they dragged themselves around until my husband finally had to shoot them.

``Our land is contaminated. Our water is contaminated. What do we do? Where do we go? We're too old to start over.`"