

9/11: Anatomy of an Environmental Disaster

9/11
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World Trade Center Dust--Why was it so toxic?

During the collapse of the World Trade Center (WTC), two 110-story buildings and their contents were pulverized into an enormous dust cloud that billowed over vast areas of Lower Manhattan and Brooklyn, with much of the dust settling at and around the disaster site--a 10-story, 16-acre rubble pile weighing an estimated 1.8 million tons, under which dozens of oil-fed fires raged and burned. Due to its unique composition, **WTC dust was exceedingly toxic:** pulverized building materials such as concrete, gypsum, glass and asbestos, as well as the building's contents--computers, fluorescent fixtures, styrene furniture, nylon carpeting and PVC-insulated telecommunication cables--**were all blasted into a toxic chemical dust the likes of which had never been encountered in human history.** In addition, thousands of pounds of arsenic, lead, chromium, mercury and other toxic substances from the destroyed U.S. Customs Service laboratory were pulverized and released into the mix during the collapse.

World Trade Center Fires

On September 11th, **200,000 gallons of diesel fuel and transformer oil stored in tanks underneath the WTC site ruptured and caught fire,** creating a giant underground inferno beneath the pile on which the rescue workers toiled. These fires burned and smoldered until late into January 2002, **releasing vast amounts of toxic chemicals and petroleum emissions.** Emissions from the WTC fires were so strong that air pollution expert Thomas Cahill's UC-Davis monitoring station *one mile from Ground Zero* recorded levels 15-20 times higher than any previously recorded in the US. Cahill declared that the **emissions from the WTC fires were greater than those of the Kuwait oil field fires** after the Gulf War.

Corrosiveness of WTC Dust

- Trade center dust was **highly corrosive** to human lungs, due to the high content of concrete, gypsum and glass.
- The dust was also **highly alkaline**, with common readings of between 9.5 and 10.5, the alkaline equivalent of ammonia, or even 12.1--**the corrosiveness of drain cleaner**.

WTC Toxins:

Asbestos

- 400 to 1,000 tons of asbestos from the Twin Towers were pulverized and released into the air and dust cloud during the building collapse. This translates to a shocking **800,000 to 2,000,000 (two million) pounds**.
- Little professional abatement was done, and the majority of the dust and rubble which harbored asbestos and other toxins was **handled directly by the responders**, most of whom did not have any protective respiratory gear.
- This lack of professional abatement and protection for recovery personnel and is in stark contrast to the **\$90M 7-month evacuation and abatement to the Gramercy Park neighborhood of Manhattan**, which had been contaminated by a mere 200 pounds of asbestos when a Con Edison steam pipe exploded in 1989.
- Asbestos levels measured in many parts of lower Manhattan were **higher than those found in Libby, Montana**, where the EPA conducted a massive 'Superfund' town cleanup in 2001 because of widespread asbestos contamination.
- The EPA chose to endorse **outdated testing methods** for its Ground Zero asbestos monitoring, that permit asbestos levels **4-8 times higher** than the standards applied at the Libby, Montana site.
- Even utilizing the outdated methods, 35% of the EPA testing showed dangerous 'above 1%' levels.
- Independent testing showed **consistently unsafe levels** of asbestos, **up to 150 times higher** than the EPA standard.
- In early asbestos tests, on 8 occasions the filters of the EPA monitoring stations became **so overloaded with particulate matter that they could not be analyzed**.
- Asbestos levels in the drain water from the WTC site were 9.6 billion fibers per liter, **over 1000 times the accepted safe level** of 7 million fibers per liter.

Lead

- An estimated **200,000 to 400,000 pounds of lead** from the Twin Towers' computers was pulverized and released into the dust cloud during the building collapse.
- Lead exposure can damage body systems, particularly the central nervous system, reproductive system, and kidneys. **Infants and unborn children are particularly at risk.**
- 17.5 % of EPA tests showed elevated lead levels. However, those tests were 'grab samples' only, and not the more thorough 24 or 72-hour extended tests that indicate accurate readings. During that same period (October 2001), **the UC-Davis monitoring station one mile from Ground Zero recorded dangerously elevated lead levels** in the air.

Mercury

- Mercury is **so poisonous at even minute quantities** that all discarded lamps and light fixtures are considered hazardous waste materials.
- **500,000 mercury-containing fluorescent fixtures** were shattered during the WTC collapse, resulting in an estimated **10-25 pound release of mercury.**
- The amount of mercury in the WTC collapse has the potential to pollute a **400,000 acre** (or 625 square mile) lake.
- Mercury exposure causes **lung, brain and kidney damage**, increases in blood pressure and heart rate, eye damage, skin rashes, impairment of vision and hearing and memory loss.
- Water samples taken within one week of the disaster showed **extraordinarily high levels of mercury**: 8.8 parts per billion, four times the Agency's 'Acute Marine Criteria', the rate at which most fish are killed within one hour.
- Private testing to a building northeast of the WTC site showed high levels of mercury that had **penetrated to even behind the walls**, as well as asbestos and dioxin.
- A random testing of 15 Port Authority workers at the site found **elevated levels of mercury in the blood.**

Dioxins & Furans

- **Highly carcinogenic compounds** generated as by-products of the combustion of plastics, chlorinated chemicals, bleached paper products, or the incineration of wastes.
- The EPA had **no standards for safe dioxin air levels at the time of the WTC attacks.** The agency devised **impromptu safety benchmarks** to deal with the crisis that shocked scientists nation-wide because of the seemingly arbitrary levels and lack of peer review from within the agency.

- In spite of the low benchmark safety levels, **EPA tests showed dangerous dioxin levels in 43% of tests around Ground Zero, and as far as one mile away from the site.**
- The most notorious dioxin is TCDD, also known as **Agent Orange**. The chemical was used extensively by the U.S. military in Vietnam as a defoliant during wartime. Agent Orange has affected the health of up to 2.6 million Vietnam veterans.
- Agent Orange exposure results in **prostate and respiratory cancer, multiple myeloma, type II diabetes, Hodgkin's disease, Non-Hodgkins Lymphoma, Soft Tissue Sarcoma**, and other illnesses. Children of Agent Orange-exposed victims are also affected.
- Dioxins and furans accumulate in body fat and have a half-life of 7-20 years.

PVCs--Polyvinylchloride & PCBs--Polychlorinated biphenyls

- Staggering levels of PVC emissions occurred at Ground Zero as a **by-product of the petroleum fires, plus the combustion of the miles of plasticized telecommunications cables** contained within the buildings.
- When burned, PVC produces over **300 species of poisonous toxins**, including phthalate, anhydride, **benzene**, xylene, toluene, formaldehyde, polyaromatics, chlorine & hydrogen cyanide.
- Long term effects of PVC exposure include **impaired disease resistance, coughing, sore throats, loss of lung function, asthma, upper respiratory allergies, headaches, memory impairment, dizziness, depression, menstrual difficulties, malignancies, blood ailments, vascular disorders and a host of cancers.**
- Dangerous levels of benzene were found consistently at the site all the way through January.
- Sample readings in October found benzene levels **58 or 86 times** the safe threshold (October 5 & 11). A January 7, 2002 benzene reading found **180,000 ppb--180 times above the OSHA limit** of 1,000 parts per billion in air.
- **PCB emissions**--released by burning petroleum--affect the immune, nervous, reproductive and endocrine systems and are **known carcinogens**.
- Drain water flowing off the WTC site on September 14 showed PCB levels **75,000 times higher than any previously reported.**

Research compiled by Claire Calladine, co-founder **9/11 Health Now**, from the book *Fallout--The Environmental Consequences of the World Trade Center Collapse* by Juan Gonzalez