

Comments on Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster

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Summary:

EPA widely publicized a conclusion made in this NCEA document; namely, that persons in the community were not likely to have a short- or long-term adverse health effects caused by exposure to air and residential dust from the Collapse of the World Trade Center. (NCEA page 2) But this position is not adequately supported by data in this report.

EPA also has not adequately considered the risk from particulate-bound mercury in WTC dusts. Tests conducted by Uday Singh and witnessed by Marjorie Clarke and others are cited in support of this criticism.

EPA did not take adequate measurements of environmental conditions immediately in the aftermath of 9/11 or subsequently, and refused offers of assistance from other government agencies. This resulted in a poorer dataset than could have been obtained, and an unnecessarily inferior risk assessment. Despite insufficient data, EPA made premature public pronouncements that the air was safe, while at the same time withholding from the press and the public the data it did have. Many months after the disaster, EPA is still withholding data and not releasing analyses to the press or public.

EPA's comparison of measurements of PM_{2.5} and heavy metals in air near the WTC vs. other measurements in New York and other urban areas is flawed and misleading. Though EPA uses three nonspecific urban locations in 3 cities in 2000 as background levels, and those levels are somewhat similar to one another, another location and time (NYU Medical Center in 1976) cannot be used as current urban background since laws that went into effect since then have shut down thousands of sources of heavy metals in the urban air. The WTC-contaminated air was one to three orders of magnitude higher than the 2000 urban air locations.

EPA made errors in sampling and analysis of dioxin and PCBs, using inappropriate techniques, and retaining data resulting from use of such techniques, and employing assumptions that underestimate the risk from exposure to such compounds.

NCEA Statements

Our Critique of NCEA's statements

<p>Persons in the community were not likely to have a short- or long-term adverse health effects caused by exposure to elevations in ambient air concentrations of the contaminants evaluated in this report. (NCEA p. 2)</p> <p>AND YET, NCEA states:</p> <p><i>“Because there are only limited data on these critical few days, exposures and potential health impacts cannot be evaluated with certainty for this time period.”</i> (NCEA, page 2)</p>	<ul style="list-style-type: none">• The plume from the initial collapse and over three months of uncontrolled incineration over a large part of urbanized New York City; suspended air pollutants became a fine dust which permeated everything and upon entrainment became a continuing source of exposure. Aerial photos taken within days of 9/11/01 by NASA show the plume over Brooklyn, Jersey City and Manhattan (see http://www.911ea.org/Plume_Pictures.htm) and pictures from EPA's website: http://www.911ea.org/EPA_Web_Pictures.htm The last picture on this page shows an indoor space. Remote sensing data by USGS show scattering of several types of asbestos to the edges of the map which goes above 23rd St; the map does not show that the density of the asbestos in the immediate ground zero area is less than in surrounding areas.• Concluding that, except for persons working on the pile, no other people are likely to have short- or long-term adverse health effects ignores data that has been generated by the Mt. Sinai World Trade Center clinic, and Dr. Stephen Levin, who has repeatedly testified before legislative hearings and conferences that most of the hundreds of patients he has seen for respiratory problems related to the WTC are not getting better. These patients are not only WTC pile workers, but also others exposed to the immediate WTC collapse materials (i.e., concrete, asbestos, fiberglass), but also the toxic substances generated during months of incineration (i.e., fine particulate coated with scores of substances including dioxins, furans, PCBs, mercury, lead, chromium, cadmium, arsenic, sulfates and many others plus vapor mercury and VOCs).• That many of the substances, above are carcinogenic, and that many thousands of people (residents, pile workers, local business workers, schoolchildren, frequent visitors) were exposed for months, has sowed the seeds for future cancers. This exposure, added to pre-existing body burdens of carcinogenic substances, already high in the New York metro area, could well cause an increase in cancer rates. This has not been considered in this document.• While it is true that as concentrations of toxic substances in outdoor air diminished with time, time does not reduce indoor dust concentrations. Therefore it cannot be assumed that persons indoors will be at reduced risk over time. This is especially true of the elderly, infirm and children who may spend most of their time indoors. Once fine particulate enters buildings there are no natural mechanisms such as wind and rain to clean it out. And there are materials such as carpet, upholstered furniture, ductwork and other items in which dust accumulates and is held.• EPA left cleaning of interiors to the City, which left it to landlords, which left it to tenants who did not have training or respirators, and EPA never
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conducted a comprehensive sampling and analysis of the indoor WTC dust either immediately around ground zero or in more distant locations through which the plume went.

- The NYC Department of Health and other government agencies encouraged tenants to clean their own apartments of hazardous contamination using a wet mop and a paper mask, even as government personnel in hazmat suits were cleaning the streets outside of the same contamination using sophisticated equipment. This dust contained friable asbestos and many other toxic substances that under different circumstances (e.g. typical asbestos removal) would have required the space to be encased in plastic, workers in hazmat suits, using specialized equipment, and post-testing for asbestos. The Department of Health's information was broadcast and printed by the media and posted to the public via its website for many months after 9/11/01. Proper hazmat cleaning was not offered to residents or businesses until summer, 2002, many months after tenants did their own cleanings (or not). In either case tenants were exposed to hazardous dusts which built up in reservoirs in the interior spaces and kicked up into the air due to normal movements indoors. In considering only the contaminants in outdoor air, NCEA has underestimated the exposure of residents and office workers. Toddlers have an additional pathway of exposure which was not considered. (crawling in / eating dust).

- It is in EPA's own protocol for cleaning of asbestos that the carpets, upholstery and other soft surfaces must be removed. Not only did the fine toxic dust settle into carpets, but all kinds of reservoirs, such as HVAC systems, elevator shafts, upholstery, draperies, and clothing. And it is clear that fine dust cannot be removed from carpet and similar textile materials successfully. See the following references:

<http://www.epa.gov/iaq/pubs/airduct.html>

1. Evaluation of Two Cleaning Methods for Removal of Asbestos Fibers from Carpet, US EPA Risk Reduction Engineering Laboratory, Cincinnati, OH 45268, Publication No. EPA/600/S2-90/053, April 1991, available as www.epa.gov/ncepihom/nepishom/
2. Evaluation of Three Cleaning Methods for Removing Asbestos from Carpet: Determination of Airborne Asbestos Concentrations Associated with Each Method. US EPA Risk Reduction Engineering Laboratory, Cincinnati OH 45268, EPA/600/SR-93/155, September 1993, available at www.epa.gov/ncepihom/nepishom/
3. Clean-up of Lead in Household Carpet and Floor Dust, Lynda Ewers, et. al., American Industrial Hygiene Association Journal, 55(7):650-657 (1994).

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- EPA did not do personal monitoring of people who were not on the pile,

and so has no information of exposures or potential health impacts outside of Ground Zero. (All references furnished today about Personal Exposure Assessment are from a limited study by NYCDOH.)

- EPA also did not do any surveys or health monitoring of large populations of children in schools around Ground Zero. But it is well known downtown that children, particularly at prestigious Stuyvesant High School, four blocks from Ground Zero, suffered considerably from a variety of pulmonary ailments. These children were threatened by the Board of Education, that if they did not return to Stuyvesant on October 9, 2001, then they would not be able to return to Stuyvesant ever! Lines two hours long to the school nurse were common, but many students would not wait that long and return to class. Good records were not kept. Why has it taken a year and a half to even begin studies? Two-thirds of the students will be graduated by this June. Does EPA believe that accurate information and recall is possible at this time? What will be done differently next time?
- EPA did not measure the contribution to the total toxic exposure from ingestion of inhaled materials which were swallowed when particles were raised by the lung's natural clearing mechanisms. It is known that ingestion of dioxins, PAH, PCB, and toxic metals is an important pathway of exposure. (Patty's Industrial Hygiene and Toxicology, 4th Edition, Ed: George D. Clayton & Florence E. Clayton, John Wiley & Sons, Inc., 1994. Monona will give me rest of cite.) (http://www.industrial-hygiene.com/new_page_2.htm).
- What was the process that EPA used for devising protective standards for WTC air as a whole (not discrete pollutants)? People breathed and responded to all the pollutants at one time, not just one. EPA has not included any increase of health impacts resulting from synergy of the many toxic substances, and so has underestimated the long-term serious health risk. Testimony given by Dr. Steven Levin of Mt. Sinai's WTC clinic to the New York State Assembly Hearing in November, 2001, states that cigarette smoking increases the carcinogenic effect of asbestos inhalation by 80 to 90 times for lung cancer. This synergy has not been factored into EPA's risk assessment or into its risk communications with smokers who were exposed to WTC contamination.
- EPA admits that insufficient monitoring was done for emissions of toxics in the first few days after 9/11/01. Those trapped in their apartments during this time, including the elderly and those already at significant risk, would have been exposed to extremely high levels of many air pollutants. EPA has not evaluated impacts on this population.

	<ul style="list-style-type: none"> Table 2, p 43 of the NCEA document shows clearly that there is one to three orders of magnitude greater concentration of heavy metals (Pb, Cr, Zn, Cd, Cu, Fe, Al among others), chlorides, bromides, and respirable particulate matter in the 3 locations of WTC-contaminated air sampled vs. background dust levels from the Bronx, Boston and Philadelphia, in 2000. That the data for these 3 locations are averages over the months of September and October, 2001, makes this revelation all the more worrisome. This fact is not mentioned in the executive summary and no account is taken for it in the report's conclusion of no risk for individuals exposed to WTC contamination outside of ground zero. That there were additional exposures from the residual dusts being stirred up in indoor spaces, makes this finding even more noteworthy. <p>(In Table 2, the column of figures from NYU Medical Center in August 1976 are misleading in this comparison because leaded gasoline was still being burned in cars, and because thousands of apartment incinerators, a number of municipal incinerators, including 2 nearby in Greenpoint and Maspeth, and many hospital-based pathological waste incinerators – some in the vicinity of the NYU medical center - had not yet been eliminated. New York City Local Law 49 of 1970 (or maybe 1989), the NYC Air Pollution Control, specifically exempted hospitals in the ban on new incinerators and the requirement to upgrade any that continued to operate.)</p> <p>For these reasons, the EPA NCEA statements indicating that there is no long-term health risk cannot be supported and should be publicly withdrawn.</p>
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<p>EPA has admitted that in the first several days after 9/11 exposures and potential health impacts cannot be evaluated with certainty. (NCEA page 2)</p>	<ul style="list-style-type: none"> The TERA peer review of EPA's COPC document indicated that there were 14 contaminants that should have been measured, but EPA only measured 4. EPA also did not measure systematically, using a statistically significant sample size of locations, arrayed in a grid, and furthermore only measured certain highly toxic substances once a day, using a grab sample for four minutes. (Four minute grab samples are useful for identifying chemical composition of erratic odors. Longer (whole shift) sampling times are required for exposure assessment and such samples are technologically feasible. Worker exposure assessment data only provides a snap shot of potential residential exposures.) Since EPA's sampling locations were stationary and few, measurements sometimes were upwind of the plume and therefore were not representative.
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<p>EPA delayed measuring many toxic air pollutants and dust until 3 to 11 days after the event. (NCEA</p>	<ul style="list-style-type: none"> There is an established plan called the National Contingency Plan, designed to allow EPA to swarm over a serious environmental disaster and to coordinate the use of all equipment and trained people at their disposal if the disaster requires it because of its magnitude and/or because of its proximity to dense urban areas. EPA Region II refused timely offers of instruments and/or personnel offered from both EPA Region 8 (which
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page 2)

covers Libby, Montana) as well as the Desert Research Institute. This refusal requires a public explanation and we wish to see it in the response document (along with answers to our other questions and points). The public should also know what EPA and sister agencies (health etc.) are prepared to do at the next event, should it be tomorrow (a retaliatory attack of some kind, perhaps)?

- What has EPA done to make all future communications with all sister agencies (federal, state and local) instantaneous in the case of future events? The Commissioner of NYCDEP (Miele) did not have a meeting with the acting Region II EPA administrator for two weeks after 9/11/01. Why did it take so long? And why did EPA decide to delegate indoor cleaning to NYCDEP? Did EPA ensure that NYCDEP had adequate staff to thoroughly test and remediate all affected interiors in a timely manner before it made this decision to delegate?
- Andrew Schneider of the St. Louis Dispatch newspaper wrote long accounts <http://www.911ea.org/PhotoAlbum.htm> (below the photos) detailing how USGS came in a few days after 9/11, did a series of overflights of Manhattan to detect deposits of asbestos and other contamination from the air, and brought back dozens of sample bags of toxic dusts collected from 35 locations, even from apartments at the 30th floor 3 blocks away, analyzed them within days, and had the results peer reviewed in a flash. They found many types of contaminants... "All of these techniques are used to define the composition of the dust, and we were looking at 40 different minerals," Swayze said. "They each back each other up. Some techniques can see more than others, and we were throwing in every technique we had in house." "Within hours, some results started coming back. They did find the asbestos they were searching for. But they also found an alphabet soup of heavy metals." "The Geological Survey's test results were posted Sept. 27 [2001] on a Web site restricted to government agencies. "The USGS data was also discussed by an interagency group of scientists, epidemiologists and health officials," Bellow said. But neither the EPA headquarters nor its New York office would comment on what came out of these discussions or which EPA results they were "consistent" with." To what degree has this information been used for a risk assessment for those exposed to WTC dusts and vapors, and in the NCEA document? Why doesn't the government make these data readily available to the public or to researchers? What has been done to make this process happen faster next time?
- In October, 2001, Berry Shore at EPA Region II was asked for all the data that had been collected; and he said that it was being withheld from the public and from independent scientists for national security purposes. What is that all about? The public deserves an explanation for this behavior to hide data on potentially dangerous conditions. Will this

	<p>happen again next time?</p> <ul style="list-style-type: none"> • EPA Region II had 250,000 pages of air pollutant measurement data at its Edison, NJ offices as of June, 2002, and to date has not produced an analysis of this data, nor has this data been shared with the public. What has EPA done to address this shortfall of personnel, as well as the secrecy, for the WTC issue as well as the future? If the Empire State crumbled tomorrow, would we have the same situation with lack of data, lack of information for the public – or worse, a mischaracterization of risk based on no data, lack of communication among agencies, and lack of hazmat remediation?
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<p>EPA NCEA did not evaluate the health impact of mercury emissions from the WTC environmental disaster.</p>	<ul style="list-style-type: none"> • Mercury and VOC's would have been dispersed and deposited as the air cooled away from Ground Zero, they would not be found in as high concentrations at ground zero. Uday Singh, Industrial Hygienist, found elevated levels of mercury in the street, and office and residential spaces, until as late as June, 2002 and February 2003. Mercury content in a sample collected on February 11, 2003 at Fulton Street Subway Entrance was 0.33mg/kg). • Vapor mercury measured above WTC dust in-situ in 125 Cedar Street in April, 2002 was elevated but when a small sample was set on fire, the vaporized mercury caused the ambient level to increase 5 to 10 times. This test indicated that not all mercury released during the collapse of the WTC vanished; a significant amount adhered to particulate matter. • For the common 3 foot fluorescent tube, there is 25-50 mg. Once broken it releases approximately 35,000 ng/m³ of mercury vapor. The World Trade Center complex had thousands of these bulbs. (In looking for WTC mercury vapors, Uday Singh found 24,000 ng/m³ in basement garbage dumpster, Independence Plaza, April, 2002. These vapors probably emanated from a discarded and broken fluorescent bulb.) (http://www.industrial-hygiene.com/Mercury%20contamination%20newsletter.pdf.)
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<p>“It would be reasonable to conclude that the concentrations to which individuals could potentially be exposed, in the range 10.0 to 170.0 pg TEQ/m³ within and near the WTC site found through the latter part of November, are likely the highest</p>	<ul style="list-style-type: none"> • EPA / ERT used sampling methods used for incinerator emissions – designed to measure very high emissions at stack level, where one sample was of only 7 m³ of air. This sampling method was not appropriate for measuring ground level ambient dioxin concentration and should have not been employed. Instead, EPA arbitrarily assigned ½ detection limit to results from these tests. For the EPA samples which drew 1000 m³ of air per sample, dioxin concentrations were 5 to 50 times typical ambient dioxin levels in cities, which themselves are elevated over non-urban areas. Therefore, EPA, in mixing good sampling protocol with misleading and inappropriate protocol, has underestimated the dioxin concentrations.
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<p>ambient concentrations that have ever been reported.” (Page 77, NCEA)</p> <p>“EPA regulatory programs, such as the Superfund Program, typically consider individual incremental cancer risk estimates made in this manner (i.e., in the context of a scenario-based risk assessment) in the range of 10⁻⁴ to 10⁻⁶ to be of potential significance, depending on the circumstances.” NCEA, p. 81.</p>	<ul style="list-style-type: none"> • Dioxins were one of the many toxics not sampled well enough to accurately characterize the risk from the WTC environmental disaster. Studies by Lioy in 2002 showed that pollutants were not evenly dispersed geographically. This necessitated the use of more, not fewer, number of sampling stations. Among the first data, taken a couple of blocks north and east of the perimeter show ambient dioxin levels of as high as 0.16 ng/m³ TEQ, measured at ground level, which is 60% higher than the European emissions standard for dioxins at the stack level. Emissions standards for incinerators are set orders of magnitude higher than concentrations expected at ground level after dispersion takes place. That dioxin concentrations at ground level over a week after 9/11/01 were this high, likely indicates that they were orders of magnitude higher than standard writers consider to be safe exposure. • EPA NCEA cites that dioxin concentrations at ground level near solid waste incinerators in Columbus, OH and Niagara Falls were not as high as measurements taken near the WTC, yet these dioxin concentrations precipitated closures of these incinerators. Why is it that the dioxin concentrations near the WTC, especially in combinations with many carcinogenic, teratogenic, and otherwise toxic pollutants, are not deemed to be of concern to public health?
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<p>“For exposure to dioxin-like PCB congeners alone, the slope factor developed for dioxin-like compounds should be applied (EPA, 2000a). This assessment does not consider exposure and risk from dioxin-like PCBs because these congeners were not measured separately.” Page 68 NCEA</p>	<ul style="list-style-type: none"> • What was the impact of PCBs and other organics on the level of risks calculated for dioxin exposure? Why didn't EPA measure congeners of PCBs so that the risk from PCBs could be included in the dioxin risk assessment? Not doing so has underestimated the health risk from these compounds.
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<p>“Exposure to dioxin-like compounds represents a unique circumstance, in that background exposures are already within this range and, in fact, at the upper end of this range”. NCEA p. 81.</p>	<ul style="list-style-type: none"> • Since EPA realizes that New Yorkers are already at high risk for cancer due to background exposures to a variety of pollutants, the agency should have taken more care to assess the combined risk due to the carcinogens already in the tissues and all carcinogens in the various pathways of exposure.
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