

06-5324-CV

In the  
UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

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**IN RE WORLD TRADE CENTER  
DISASTER SITE LITIGATION**

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**BRIEF OF NEW YORK COMMITTEE FOR  
OCCUPATIONAL SAFETY AND HEALTH**

**IN SUPPORT OF PLAINTIFFS-APPELLEES**

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**BRIEF FOR AMICUS CURIAE**  
**NEW YORK COMMITTEE FOR OCCUPATIONAL SAFETY AND**  
**HEALTH**

**INTEREST OF AMICUS CURIAE**

The New York Committee for Occupational Safety and Health (NYCOSH) is a non-profit, nongovernmental coalition of 250 local unions and 400 healthcare and legal professionals, rank-and-file safety and health activists and concerned citizens in the New York City metropolitan area. NYCOSH has provided technical assistance and comprehensive training in occupational safety and health to unions, employers, government agencies, and community organizations for over 25 years.

Since the tragic events of September 11, 2001 and continuing to this day, NYCOSH, in partnership with the National Disaster Ministries of the United Church of Christ, has worked closely with unions, employers, and community and tenant organizations at Ground Zero and throughout Lower Manhattan. This work has included outdoor and indoor environmental sampling, technical assistance with the design or

evaluation of sampling, cleanup, and re-occupancy protocols, and with mechanical ventilation and filtration issues.

Within days of 9/11, NYCOSH produced and distributed the first fact sheets describing respiratory hazards at Ground Zero and outlining appropriate respiratory protection. NYCOSH provided technical assistance to unions at, under, and around Ground Zero, and trained hundreds of Lower Manhattan workers about 9/11-related occupational and environmental health issues. In collaboration with the Queens College Center for the Biology of Natural Systems and the Latin American Workers Project, NYCOSH operated a mobile medical unit near Ground Zero which provided medical screenings to hundreds of immigrant day laborers engaged in the cleanup of contaminated offices and residences. NYCOSH also provided respirators to these cleanup workers, along with change-out filter cartridges, fit-testing, and training on proper respirator use. In November 2002, NYCOSH received the American Public Health Association's Lorin Kerr Award for speedily contacting the U.S. Occupational Safety and Health Administration regarding the lack of protections for rescue workers at the World Trade Center.

NYCOSH continues to work closely with health care centers of excellence and with unions, employers, and tenant and community organizations to ensure that their constituents are informed about and have access to appropriate medical care for 9/11 health conditions. NYCOSH has provided testimony on the environmental and public health consequences of the 9/11 attacks to the New York City Council and the U.S. Congress.<sup>1</sup>

## **INTRODUCTION AND SUMMARY OF ARGUMENT**

The attack on 9/11 produced not only an initial catastrophic loss of life at the World Trade Center (WTC) site, but also a lingering environmental disaster, with adverse health consequences for responders at Ground Zero as well as for workers and residents in a much larger geographic area. That rescue and recovery workers at the WTC site were being exposed to toxic contaminants should have been readily

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<sup>1</sup> Oversight Hearing on the U.S. Environmental Protection Agency's Response to Air Quality Issues Arising from the Terrorist Attacks of September 11<sup>th</sup>, 2001: Were There Substantive Due Process Violations? Before the Subcomm. on the Const., Civil Rights, and Civil Liberties of the H. Comm. On the Judiciary, 110th Cong. (2007) (test. of David M. Newman, New York Committee for Occupational Safety and Health); Oversight Hearing on the Environmental Impacts on Lower Manhattan Due to the Terrorist Attack on the World Trade Center Before the New York City Council Committee on Environmental Protection (2001) (test. of the New York Committee for Occupational Safety and Health).

apparent to officials and agents of the Defendants City of New York (City), the Port Authority of New York and New Jersey (Port Authority), and various private companies with whom the city contracted to do work at Ground Zero (Contractor Defendants). Almost immediately following the events of 9/11, City officials had access to information revealing that toxic materials had been released in the World Trade Center buildings' collapse. For example, information that the buildings had contained asbestos fireproofing was widely available. Port Authority, as owner of the World Trade Center site, was intimately familiar with the construction history, contents, and potential toxicity of the collapsed towers.<sup>2</sup>

Furthermore, environmental sampling showed that workers at Ground Zero were exposed to contaminants at levels exceeding federal standards. NYCOSH and other occupational safety advocates warned publicly of the dangers posed by these exposures and advocated the use of air-purifying respirators. Having ready access to this publicly available information, Defendants should have known that workers at Ground Zero were at serious risk of developing respiratory illnesses.

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<sup>2</sup> In Re World Trade Center Disaster Site Litigation, 456 F.Supp.2d 520, 525 (S.D.N.Y. 2006).

Finally, harm to human health has in fact already occurred and will likely continue to unfold. Exposed rescue and recovery workers, including Plaintiffs, suffer from a range of adverse health effects. The exposure to inhaled carcinogens, including asbestos, has prompted medical researchers to express concern for late-emerging cancers in these workers.

## **ARGUMENT**

### **I. Credible, substantive data that indicated the presence of toxic substances in significant quantities at the WTC site were publicly available prior to, on, and subsequent to 9/11.**

The current scientific literature is unambiguous as to the extensive dispersion and hazardous contents of WTC dust. Contaminants were dispersed over a wide area of Lower Manhattan and Brooklyn, and for “miles beyond.”<sup>3</sup> Hundreds of contaminants have been identified in air, dust, and bulk samples.<sup>4</sup> Toxic contaminants of concern include asbestos,

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<sup>3</sup> Philip J. Landrigan et al., Health and Environmental Consequences of the World Trade Center Disaster, 112 *Envtl. Health Persp.* 731, 731 (2004).

<sup>4</sup> Id.; John K. McGee et al., Chemical Analysis of World Trade Center Fine Particulate Matter for Use in Toxicologic Assessment, 111 *Envtl. Health Persp.* 972, 978-80 (2003); Centers for Disease Control and Prevention, Occupational Exposures to Air Contaminants at the World Trade Center Disaster Site—New York, September - October 2001, 51 *Mortality and Morbidity Wkly.* 453, 453-55. (2002).

PCBs (polychlorinated biphenyls), PAHs (polycyclic aromatic hydrocarbons), manmade vitreous fibers, dioxins, volatile organic compounds, crystalline silica, pulverized glass shards, highly alkaline concrete dust, and lead, mercury, and other heavy metals.

**A. Essential information about the potential for the release of toxic substances during the collapse of the WTC towers was known or should have been intuitive to Defendants.**

Buildings the size of the WTC towers contain thousands of tons of toxic materials. Office equipment, like computers and telephones, contain heavy metals. Light bulbs contain small but toxic amounts of mercury. Plastics, when burned, create polyvinyl chloride (PVC) combustion products, including dioxins. The WTC buildings themselves were partially fireproofed with asbestos. In addition, the combustion of 90,000 pounds of jet fuel in the attack resulted in a variety of combustion byproducts, including dioxin and polycyclic aromatic hydrocarbons<sup>5</sup>—two known carcinogens of significant health concern.<sup>6</sup> With the

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<sup>5</sup> Robin Herbert, et al., The World Trade Center Disaster and the Health of Workers: Five Year Assessment of a Unique Medical Screening Program, 114 *Envtl. Health Persp.* 1853, 1853 (2006).

<sup>6</sup> Agency for Toxic Substances and Disease Registry, U.S. Dep't of Health and Human Serv., Toxicological Profile for Chlorinated Dibenzo-p-Dioxins (1998); Agency for Toxic Substances and Disease Registry, U.S. Dep't of Health and Human Serv., Toxicological Profile for Polycyclic Aromatic Hydrocarbons (1995).

destruction and intense heat that accompanied the towers' collapse, the release of all these materials was inevitable. This calculus should have been apparent at the time to any environmental or occupational health professional.

Moreover, much information on hazardous in-place building materials was already widely known in the regulatory and public health communities. Defendants were without a doubt cognizant of the potential for the release of hundreds of thousands of pounds of asbestos into the ambient air during the collapse of the WTC towers on 9/11. An estimated 400 or more tons of asbestos were used in sprayed-on fireproofing during the construction of the WTC towers.<sup>7</sup> Additional unknown amounts of asbestos-containing material were used in pipe insulation and floor tiles. The extensive use of asbestos at the WTC site was well documented prior to 9/11. In 1971, while the WTC was still under construction, New York City passed Local Law 49, which banned the use of sprayed on fireproofing that contained asbestos, effective

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<sup>7</sup> Megan D. Nordgrén et al., Natural Resources Defense Council, The Environmental Impacts of the World Trade Center Attacks—A Preliminary Assessment 3 (2002); Michael B. Gerrard, World Trade Center: Response, Recovery and Reconstruction, N.Y.L.J., October 4, 2001, at 3.

February 25, 1972.<sup>8</sup> See New York City, N.Y., Code § 24-146. The 1993 bombing of the WTC again raised the issue of inadvertent releases of WTC asbestos during disaster events, and some WTC asbestos was abated.

Similarly, the danger that office furnishings housed in the towers would contribute additional toxic substances should have been intuitive to any environmental or occupational health professional. For example, computers and computer components contain significant amounts of lead.<sup>9</sup> It can be conservatively estimated that there were greater than 10,000 personal computers in the WTC complex, each containing four or more pounds of lead, as well as numerous mainframe computers and servers.<sup>10</sup> Consequently, it is likely that at least 40,000 pounds of lead were released into the general environment on 9/11, and very possibly a substantially larger amount.

The fluorescent light bulbs in the WTC buildings were another obvious source of contamination. Every fluorescent bulb contains tiny

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<sup>8</sup> Arthur M. Langer & Roger G. Morse, The World Trade Center Catastrophe: Was the Type of Spray Fireproofing a Factor in the Collapse of the Twin Towers?, 10 *Indoor and Built Environment* 350 (2001).

<sup>9</sup> Yadong Li et al., TCLP Heavy Metal Leaching of Personal Computer Components, 132 *J. of Env'tl. Eng'g* 497, 497 (2006).

<sup>10</sup> Nordgrén, supra note 7 at 3.

but environmentally significant amounts of mercury.<sup>11</sup> The amount of mercury in a single bulb is estimated to range from 3 to 21 milligrams. The Port Authority acknowledges the presence of 500,000 fluorescent light bulbs in the WTC complex.<sup>12</sup> It is therefore possible that the amount of mercury released from fluorescent light bulbs only (and not including additional sources of mercury such as electric switches) ranged from 3 to 23 pounds. This is the approximate equivalent of 8% of the total daily mercury emissions from all coal-fired utility boilers in the United States or 26% of the daily mercury emissions from all municipal waste incinerators in the United States.<sup>13</sup>

**B. Toxic materials subject to federal emergency planning reporting requirements were present in the WTC towers.**

Additional sources of toxicity at the WTC site included a Secret Service shooting range housing millions of rounds of lead ammunition and a U.S. Customs Service lab storing toxic chemicals.<sup>14</sup> A report

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<sup>11</sup> Michael Aucott et al., N.J. Department of Environmental Protection, Release of Mercury from Broken Fluorescent Bulbs 1 (2004).

<sup>12</sup> Juan Gonzalez, Fallout—The Environmental Consequences of the World Trade Center Collapse 59 (New Press 2002).

<sup>13</sup> 2 U.S. Environmental Protection Agency, Mercury Study, Report to Congress: An Inventory of Anthropogenic Mercury Emissions in the United States § 4-1 (1997).

<sup>14</sup> Joel Kupferman, The Public Health Fallout from September 11, in Lost Liberties: Ashcroft and the Assault on Personal Freedom (Cynthia Brown, ed., New Press 2003).

prepared soon after 9/11 indicated the presence of arsenic, chromium, mercury, lead and other toxic raw materials at the offices of the United States Customs Service, 6 World Trade Center and the offices of the Port Authority of New York and New Jersey, 1 World Trade Center.<sup>15</sup> Pursuant to the reporting requirements of the Emergency Planning and Community Right to Know Act (EPCRA), 42 U.S.C. §§ 11021(c), 11022(a), 11002(c), facilities within the WTC complex were required to publicly itemize storage of hazardous chemicals above certain quantities. The purpose of hazardous raw materials reporting is precisely to facilitate safe emergency response and effective containment and cleanup in the event of an unanticipated chemical release. 40 C.F.R. §355.10.

**C. Environmental sampling results, publicly available subsequent to 9/11, indicated the presence of toxic substances at levels of concern at Ground Zero, as well as at other locations in Lower Manhattan.**

Almost immediately after the 9/11 catastrophe, environmental and personal air sampling obtained by government agencies confirmed the presence of air contaminants at significant levels. In particular, levels of

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<sup>15</sup> Id., citing Toxic Targeting, Inc., Toxic Targeting Computerized Report – WTC Complex New York New York 10048, September 11, 2001, Sept. 18, 2001; Suzanne Mattei, Sierra Club, Pollution and Deception at Ground Zero 13 (2004).

dioxin, a known carcinogen, in the air at the WTC site were the highest ever reported.

As early as September 18, 2001, the United States Geological Survey (USGS) reported the results of its WTC environmental studies to government response teams. USGS found that steel beams from the WTC site were coated with fireproofing containing chrysotile asbestos at concentrations up to 20%. It reported that in the “area around the WTC . . . potentially asbestiform minerals might be present in concentrations of a few percent to tens of percent” and may occur “in a discontinuous pattern radially in west, north, and easterly directions perhaps at distances greater than 3/4 kilometer from ground zero.”<sup>16</sup>

There is no doubt that rescue and recovery workers were exposed to asbestos levels exceeding federal standards. Twelve of twenty-one personal air samples obtained in September 2001 by the U.S. Public Health Service from workers sifting WTC debris at the Staten Island landfill exceeded the OSHA Permissible Exposure Limit for asbestos.<sup>17</sup> Sixty percent of asbestos air samples collected at Ground Zero by the International Union of Operating Engineers’ National Hazmat Program

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<sup>16</sup> Roger N. Clark, et al., U.S. Geological Survey, Environmental Studies of the World Trade Center Area after the September 11, 2001 Attack (2001), available at <http://pubs.usgs.gov/of/2001/ofr-01-0429/>.

<sup>17</sup> Emilcott Associates, Inc., Preliminary Report on the Health & Safety Evaluation of the Fresh Kills Landfill Project Supporting the WTC Disaster Recovery (2001).

exceeded the EPA clearance standard established under the Asbestos Hazard Emergency Response Act, the benchmark that EPA was using for 9/11 asbestos measurements.<sup>18</sup> Twenty-seven percent of 177 bulk samples initially collected by EPA and OSHA at Ground Zero were greater than 1% asbestos,<sup>19</sup> the level at which legal requirements for handling the material are triggered under federal regulations, 29 C.F.R. § 1910.1001, New York State law, N.Y. Lab. L. § 901, and New York City regulations, 15 R.C.N.Y. § 1-02.

Samples taken in November 2001 reveal that dioxin concentrations at the worksite were astronomically high. EPA test results of outdoor sampling for dioxin showed “unambiguous elevation” when compared to typical urban background levels. An EPA report noted:

the concentrations to which individuals could potentially be exposed . . . within and near the WTC site found through the latter part of November are likely the *highest ambient concentrations that have ever been reported*.<sup>20</sup>

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<sup>18</sup> James Nash, Cleaning Up After 9/11: Respirators, Power, and Politics (May 29, 2002), available at [http://www.occupationalhazards.com/Issue/Article/35479/Cleaning\\_Up\\_After\\_911\\_Respirators\\_Power\\_and\\_Politics.aspx](http://www.occupationalhazards.com/Issue/Article/35479/Cleaning_Up_After_911_Respirators_Power_and_Politics.aspx).

<sup>19</sup> Bruce Lippy, Operating Engineers National Hazmat Program, World Trade Center Disaster Air Monitoring Overview (Oct. 4, 2001), in Donald Elisburg & John Moran, National Institute of Environmental Health Sciences, Worker Education and Training Program Response to the World Trade Center Disaster, at Ref. 6 (2001).

<sup>20</sup> National Center for Environmental Assessment, U.S. Environmental Protection Agency, Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster 77 (2002) (emphasis added).

Rescue and recovery workers were potentially exposed to dioxin levels between 100 and 1,500 times higher than the levels of dioxin typically found in urban air.<sup>21</sup> The EPA findings further indicated that workers and residents who returned to areas that were reopened to the public as safe one week after 9/11 were potentially exposed to concentrations of dioxin “nearly 6 times the highest dioxin level ever recorded in the U.S.”<sup>22</sup>

Benzene levels at Ground Zero also unambiguously exceeded federal standards. Benzene was detected at Ground Zero in 57 of 96 air samples, at levels as high as 86,000 parts per billion (“ppb”). It is important to note that the OSHA permissible exposure limit (PEL) for benzene exposure averaged over 8 hours is 1,000 ppb. The OSHA short-term exposure limit (STEL) for benzene exposure averaged over a 15 minute period is 5,000 ppb. 29 C.F.R. § 1910.1028.

Even during November, readings exceeded the OSHA levels in half the tests conducted. . . . On November 8, an EPA grab sample at the North Tower plume detected 180,000 ppb of benzene—180 times above [sic] the OSHA limit. Even as late as January 7, benzene readings were as high as 5,300 ppb.<sup>23</sup>

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<sup>21</sup> Juan Gonzalez, EPA Report Buries a Revelation, N.Y. Daily News, Dec. 31, 2002.

<sup>22</sup> National Center for Environmental Assessment, supra note 20.

<sup>23</sup> Juan Gonzalez, Fallout, supra note 12, at 83.

## **II. Safety and health experts warned publicly of hazardous conditions at the WTC site and advocated the use of air-purifying respirators at Ground Zero.**

Almost immediately after the 9/11 catastrophe, occupational safety experts went public with warnings that workers involved in recovery and clean-up operations were being exposed to hazardous conditions. The EPA Inspector-General's report reveals that on the day of the attack, a federal emergency response team prepared a report recommending that respirators be used at Ground Zero.<sup>24</sup> On September 18<sup>th</sup>, 2001, USGS told government response teams that "cleanup of dusts and the WTC debris should be done with appropriate respiratory protection and dust control measures."<sup>25</sup>

As early as September 18<sup>st</sup>, 2001, in response to inquiries from workers, unions, and Lower Manhattan residents, NYCOSH listed the probable contents of contaminated air—toxic chemicals now confirmed as present at the site—and cautioned that exposure to dust and fumes "can cause serious illness or death." NYCOSH produced the World Trade Center Catastrophe Worker Health Fact Sheet, which the

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<sup>24</sup> Office of the Inspector General, U.S. Environmental Protection Agency, Report No. 2003-P-00012, EPA's Response to the World Trade Center Collapse: Challenges, Successes, and Areas for Improvement 100 (2003).

<sup>25</sup> Roger N. Clark, et al, supra note 16.

organization distributed to unions and workers at the site. The Fact Sheet explains that “dust and ash anywhere in the vicinity of the World Trade Center site” is likely to contain cement dust, drywall dust, airborne particles of burned plastics, including polyvinyl chlorides, and asbestos, a “major material used in the construction of the World Trade Center.”<sup>26</sup> The Fact Sheet warns WTC recovery and clean-up workers that inhalation of these materials is known to cause, among other adverse health effects, silicosis and cancer.

In October 2001, the National Institute for Occupational Safety and Health (NIOSH), a federal agency that is part of the Centers for Disease Control and Prevention, released its Suggested Guidance for Supervisors in Disaster Rescue Sites. The document names thirteen potential hazards. Hazard 3 explains the dangers of “[b]reathing dust containing asbestos (from pulverized insulation and fireproofing materials) and silica (from pulverized concrete), which are toxic.” NIOSH specifies that the risks of inhalation include both short-term respiratory irritation and possible chronic effects.<sup>27</sup>

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<sup>26</sup> New York Committee for Occupational Safety and Health, NYCOSH World Trade Center Catastrophe Worker Health Fact Sheet, Sept. 18, 2001, available at [http://www.nycosh.org/environment\\_wtc/wtc-catastrophe-factsheet.html](http://www.nycosh.org/environment_wtc/wtc-catastrophe-factsheet.html).

<sup>27</sup> National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services, Suggested Guidance for

**A. Safety and health experts stressed the importance of fit-testing procedures to effective respiratory protection.**

Both NYCOSH and NIOSH made clear that a respirator will not work if it is not correctly fitted to the individual. In its September 2001 Fact Sheet, NYCOSH expressly warned that “a respirator does not provide any protection if it does not fit properly, or if the seal is compromised.”<sup>28</sup> NIOSH counseled that “respirators must fit properly to protect workers.”<sup>29</sup> NIOSH and NYCOSH both stressed proper fit because respirators come in a variety of styles and sizes, to fit the individual. An air-purifying respirator (APR) has a rubberized component (the mask) with screw in or click-in valves. For the respirator to provide protection from contaminants, no air should be able to enter the mask except through the filter. Therefore, the rubberized mask must fit tightly against the facial skin. If the mask is not tightly fitted on the face, contaminated air can enter the mask from the side.

Fit-testing—“the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual,” 29 C.F.R. § 1910.134

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Supervisors at Disaster Rescue Sites, Oct. 2001, available at <http://www.cdc.gov/niosh/emhaz2.html#top>.

<sup>28</sup> New York Committee for Occupational Safety and Health, supra note 26.

<sup>29</sup> National Institute for Occupational Safety and Health, supra note 27.

(b)—is an indispensable step in providing effective respiratory protection, and is required by OSHA regulations. 29 C.F.R. § 1910.134

(f). The fit-test determines that the assigned respirator is appropriate for the individual’s facial structure. This is a technical process, done under supervision, and establishment of a fit-testing protocol is the employer’s responsibility.<sup>30</sup>

In addition, respirator users must be trained to perform a “seal check,” a procedure “conducted by the respirator user to determine if the respirator is properly seated to the face.” 29 C.F.R. § 1910.134 (b). A seal check must be performed each and every time a worker dons a respirator, to ensure that no unpurified air is entering the respirator mask. 29 C.F.R. § 1910.134 (g)(1)(iii).<sup>31</sup>

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<sup>30</sup> OSHA regulations establish that “[r]espirators shall be provided by the employer when such equipment is necessary to protect the health of the employee,” and that “the employer shall ensure that employees. . . pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT).” 29 C.F.R. § 1910.134 (a)(2); (f)(2).

<sup>31</sup> At least one official of Defendant City of New York repeatedly demonstrated actual knowledge of the risks to WTC rescue and recovery workers’ health. Kelly R. McKinney, Associate Commissioner for Environmental Health at the New York City Department of Health (DOH) during the WTC clean-up operations, coordinated the City’s worker health and safety compliance efforts at Ground Zero. Because of prior employment as an environmental engineer with the Port Authority, McKinney knew of the WTC buildings’ asbestos fireproofing (A 4141-A 4142). McKinney admits that on September 12, he saw data indicating the possible presence of asbestos in the air (A 4150-A 4151). The day after 9/11, McKinney’s department issued an advisory urging the workers at the site to wear personal respiratory protection (A 4149).

McKinney continued to demonstrate that the DOH knew of the danger workers faced when exposed to WTC dust at the worksite without respiratory protection. Through a Freedom of Information Act request, NYCOSH has obtained internal OSHA emails and

### **III. Exposure to WTC-derived contaminants resulted in harm to the health of recovery and clean-up workers.**

It is now well-established that a large and increasing number of people who were exposed to 9/11 contaminants, primarily rescue and recovery workers but also area workers and residents, are suffering serious and persistent adverse health outcomes. The incidence and persistence of 9/11-induced respiratory illness among response workers and area workers is extensively documented in the scientific literature, including among rescue, recovery, and service workers,<sup>32</sup> firefighters,<sup>33</sup>

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meeting notes. These show that in October 2001, McKinney requested that OSHA issue administrative orders and fines to enforce rules that workers wear respirators to protect from contaminants in the air at Ground Zero. On October 7, 2001, McKinney warned at a joint meeting of federal and local safety and health agencies that New York City “may formally ask the Secretary of Labor to direct OSHA to do enforcement” of appropriate respirator use (A 4209). DOH also had knowledge of the importance of fit-testing, and issued a memo averring that “respirators must be fit tested to assure proper seal.” (A 4214). These communications indicate definitively that the New York City Department of Health was aware of the potential for rescue and recovery workers’ exposure to toxic components of WTC dust.

<sup>32</sup> Robin Herbert, et al., supra note 5; Julie Herbstman et al., Respiratory Effects of Inhalation Exposure among Workers during the Clean-Up Effort at the World Trade Center Disaster Site, 99 *Envtl. Res.* 85 (2005).

<sup>33</sup> Gisela Banauch et al., Pulmonary Function after Exposure to the World Trade Center Collapse in the New York City Fire Department, 174 *Am. J. Respiratory and Critical Care Med.* 235 (2006); Gisela Banauch et al., Bronchial Hyperreactivity and other Inhalation Lung Injuries in Rescue/Recovery Workers after the World Trade Center Collapse, 33 *Critical Care Med. (Supplement)* S102 (2005); David J. Prezant et al., Cough and Bronchial Responsiveness in Firefighters at the World Trade Center Site, 347 *New Eng. J. Med.* 806 (2002); Gabriel Izbicki et al., World Trade Center "Sarcoid-Like" Granulomatous Pulmonary Disease in New York City Fire Department Rescue Workers 131 *Chest* 1414 (2007).

transit workers,<sup>34</sup> and immigrant day labor cleanup workers at buildings outside Ground Zero.<sup>35</sup>

**A. Rescue and recovery workers suffered adverse health effects as a result of exposure to materials generated during the collapse of the WTC towers.**

Medical research has definitively linked respiratory illnesses in rescue and recovery workers with exposure to WTC dust. The epidemiological standard for assessing the health risk of a substance is the correlation of intensity and duration of exposure and toxicity of the substance with incidence or severity of adverse health affects.<sup>36</sup> It is now clear that there is an association between the chronology of workers' 9/11-related exposures and the severity of their adverse health effects; i.e., those caught in the dust cloud and/or those responding at the WTC site in the first hours or days tend to have higher incidences and greater

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<sup>34</sup> Loren C. Tapp et al., Physical and Mental Health Symptoms Among NYC Transit Workers Seven and One-Half Months after the WTC Attacks, 47 Am J. Indus. Med. 475 (2005).

<sup>35</sup> Ekaterina Malievskaia et al., Assessing the Health of Immigrant Workers near Ground Zero: Preliminary Results of the World Trade Center Day Laborer Medical Monitoring, 42 Am J. Indus. Med. 548 (2002).

<sup>36</sup> John R. Mulhausen & Joseph Damiano, A Strategy for Assessing and Managing Occupational Exposures 5 (AIHA Press, 1998).

severities of health impacts.<sup>37</sup> Intensity and/or long duration of exposure to WTC dust have been identified as causes of inhalation injuries in rescue and recovery workers.<sup>38</sup>

Soon after 9/11, firefighters developed “World Trade Center cough,” a persistent cough often accompanied by respiratory symptoms severe enough to require medical leave for at least four weeks.<sup>39</sup> The cough was shown to be linked to exposure to the toxic materials at the WTC site, and the severity of the cough was associated with the intensity of exposure. A December 2001 field study found that 77% of clean-up and recovery workers at the disaster site without previous respiratory problems had developed cough, wheeze, or phlegm, and that these symptoms were related to the number of days spent working at the WTC.<sup>40</sup>

One year after the attack, WTC dust-exposed New York City Fire Department workers had already experienced a substantial reduction in pulmonary function.<sup>41</sup> Breathing tests done before and after 9/11 show that in the first year, exposed firefighters lost lung capacity equivalent to

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<sup>37</sup> Jonathan M. Samet et al., The Legacy of World Trade Center Dust, 356 *New. Eng. J. Med.* 2233, 2234 (2007).

<sup>38</sup> Banauch (2005), supra note 33 at S105.

<sup>39</sup> Prezant, supra note 33 at 806.

<sup>40</sup> Herbstman, supra note 32 at 90.

<sup>41</sup> Banauch (2006) supra note 33 at 316.

twelve years of normal loss.<sup>42</sup> Exposed NYFD workers have also been diagnosed with bronchial hyperreactivity,<sup>43</sup> granulomatous pulmonary disease,<sup>44</sup> and other pulmonary effects.<sup>45</sup>

These symptoms have persisted. The results of the WTC Worker and Volunteer Medical Screening Program, which studied 9,442 responders, show that 69% reported new or worsened respiratory symptoms while doing rescue and recovery work at the WTC site. Because pulmonary function abnormalities “were most frequent in responders who sustained the most intense exposures,”<sup>46</sup> it is clear that adverse health effects are linked to exposure to substances at the worksite. In addition, forced vital capacity (FVC), or the ability to expel air from the lungs, was five times lower among these workers than in the general population—a finding that the study explains is likely due to “inhalation of caustic dust and airborne pollutants in the course of their WTC work.”<sup>47</sup>

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<sup>42</sup> *Id.* at 314.

<sup>43</sup> Banauch (2005), *supra* note 33.

<sup>44</sup> Izbicki, *supra* note 33.

<sup>45</sup> Herbert, *supra* note 5.

<sup>46</sup> Herbert, *supra* note 5 at 1856.

<sup>47</sup> Herbert, *supra* note 5 at 1857.

**B. Researchers believe that workers exposed to WTC dust face increased risks of late-emerging cancers.**

Because Ground Zero workers and other exposed populations may have been exposed at varying levels to a robust array of inhaled carcinogens, including asbestos, dioxins, silica, benzene, PAHs, and PCBs, workers are at risk for the potential development of late-emerging cancers.<sup>48</sup> The Medical Screening Program recommends that because of the “magnitude and complexity of the exposures,” WTC responders require long-term monitoring, noting that malignant mesothelioma resulting from exposure to asbestos can remain undetected for 30-50 years.<sup>49</sup>

It is as yet unknown whether or when 9/11-derived exposures will produce late-emerging diseases, but it is prudent and scientifically appropriate to anticipate the possibility. While the latency period for solid tumors is 10 to 50 years, the latency period for hematologic and lymphatic malignancies can be as short as 4 to 5 years.<sup>50</sup> Although neither the World Trade Center Medical Monitoring Program nor the scientific literature has yet reported the occurrence of 9/11-related

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<sup>48</sup> Samet, supra note 37 at 2233.

<sup>49</sup> Herbert, supra note 5 at 1857.

<sup>50</sup> Howard Frumkin, Carcinogens, in Occupational Health – Recognizing and Preventing Work-Related Disease, Third Edition (Barry S. Levy & David H. Wegman, eds., 1995).

cancers, the Monitoring Program has begun the process of verification of self-reported cases among responder and recovery worker patients.<sup>51</sup>

## CONCLUSION

From an occupational safety and health perspective, the World Trade Center disaster site was an extremely hazardous workplace. In the first days after 9/11, environmental sampling bore out predictions by health and safety professionals that the air and dust at Ground Zero contained contaminants harmful to human health. Studies have linked the adverse health effects that rescue and recovery workers are currently experiencing to the intensity and duration of exposure to WTC dust. Because Defendants knew or should have known of the hazardous conditions and knew or should have known of the importance of proper

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<sup>51</sup> Interview by Rachel Gotbaum with Robin Herbert, Co-director, World Trade Center Medical Monitoring Program at Mount Sinai Hospital, New York (May 31, 2007), available at <http://content.nejm.org/cgi/content/full/356/22/2233/DC1>.

respiratory protection, many of the exposures that caused these illnesses were unnecessary and avoidable.

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Respectfully submitted,

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