

**AIR SAMPLING AT THE WORLD TRADE CENTER SITE  
BY THE OPERATING ENGINEERS NATIONAL HAZMAT PROGRAM  
SEPTEMBER 27, 2001 UPDATE  
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## **INTRODUCTION**

The **Heavy Equipment Operators** of the International Union of Operating Engineers (IUOE) continue to play a critical role in the clean-up of the World Trade Center terrorist attack site. The amount of debris on the site has been significantly reduced by the round-the-clock efforts of the Operating Engineers and other dedicated craft workers on site. The amount of dust released on the site has been lessened since last week but the fires continue to release smoke, sometimes more heavily than during the previous week. Operating Engineers have been moving their equipment further onto the large debris pile and, therefore, experiencing longer and more intense exposures to the smoke.

The IUOE National Hazmat Program has had a team of Industrial Hygienists collecting daily air samples of operator exposures since Wednesday, September 19<sup>th</sup>. The team has collected over 50 samples of potential contaminants, including airborne asbestos, lead, total dust, organic vapors, and acid gases. The IUOE National Hazmat Program's technical office in Morgantown, West Virginia has been compiling the data every day and then disseminating it over the Internet to the New York City Department of Health, the EPA, and the National Institute of Environmental Health Sciences. The team has also been reviewing the data collected by federal and state organizations.

## **RESULTS OF THE IUOE SAMPLING**

All of the samples were collected inside the open cabs of heavy equipment operated onsite. Most of the results have been acceptably low, generally well below any applicable OSHA standard or National Institute of Occupational Safety and Health (NIOSH) recommendation. Several samples for asbestos that were analyzed by transmission electron microscopy, however, were well in excess of the EPA final clearance level for asbestos abatement projects. A bulk sample of settled dust showed 0.6 percent asbestos, which is below the 1.0 percent level that EPA considers asbestos-containing material.

The highest result for airborne lead was only one-tenth of the level set by OSHA. Most of the readings were below the limit of detection for the method. A bulk sample of the dust showed approximately 120 parts per million (ppm) of lead. As a reference point, the EPA considers 400 ppm to be a level of concern for lead in soils where children play.

All the measurements of total dust were well below the OSHA standard of 15 mg/m<sup>3</sup>. The highest reading at the World Trade Center was 3.2 mg/m<sup>3</sup>.

The team measured parts per billion concentrations of several organic chemical vapors in the cabs of the equipment, including acetone, hexane, and benzene. Each of the three

organic vapor samples also picked up Freon, which is a refrigerant, used in the air conditioning systems of the buildings. There are reported to be several large tanks of Freon in the basement of the building that are thought to be intact but that has not been confirmed.

## **RESULTS OF SAMPLING BY OTHER ORGANIZATIONS**

Other organizations are reporting results similar to those obtained by the IUOE. Of particular note, the EPA has picked up several ambient air samples for asbestos that were analyzed by transmission electron microscopy and also exceeded the EPA clearance level for asbestos abatement. They have found that levels have been generally getting lower, however. Most of the sampling that has been conducted for asbestos around the site has been analyzed by optical microscopy, which is not as sensitive.

The EPA has also reported finding three elevated readings for lead and three for chromium. It is important to note that the EPA's acceptable level for lead is considerably lower than OSHA's because the agency is concerned with long term exposure of the general public, not work exposure.

The EPA has noted that all four of the samples taken for dioxin on September 16<sup>th</sup> showed all levels at or above the EPA's removal action guideline, which is based on a 30-year, 24-hour exposure risk scenario. The samples were reported to have been collected directly in the plume of smoke. Dioxin is an extremely toxic compound and is generated by combustion of plastics.

## **CONCLUSIONS**

The results of the air sampling conducted by the IUOE and by others support the earlier recommendation by the IUOE's team that Operating Engineers should be wearing respiratory protection. The results indicate that the half-face respirator with high efficiency dust cartridges that also protect against organic vapors and acid gases (P100/OV/AG) are sufficiently protective. This is also the conclusion of NIOSH in a policy statement from September 27, 2001.

There has been disagreement among some agencies about the necessity of protection against organic vapors and acid gases because the levels measured have been generally low. The position of the IUOE team is that the potential exposure to dioxin in the smoke warrants organic vapor protection. Additionally, the cartridges will protect against odors from bodies. The presence of large quantities of Freon means that hydrochloric and hydrofluoric acid can be generated in the presence of heat. Consequently, workers need to be protected from acid gases, too.