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OSHA SAMPLING RESULTS SUMMARY AS OF 1/8/02

Asbestos: A total of **810** samples (excluding bulk and blank samples) for asbestos have been taken. From 9/13 - 9/21, 177 samples were taken in the financial district. They were taken on OSHA personnel as they walked within certain predetermined zones. Results revealed asbestos concentrations ranging from ND (none detected) to .037 f/cc., well below OSHA's permissible exposure limit (PEL) of 0.1 f/cc. After 9/21, sampling focused on the rubble pile and those workers working on or immediately next to it. **108** of the samples analyzed exceeded OSHA's limit via PCM analysis. However, upon further analysis using discriminating counting methods and/or TEM analysis, the number of asbestos fibers found dropped dramatically to below detectable levels or well below .1 f/cc.

Carbon Monoxide: A total of **98** personal samples of workers on the rubble pile showed results ranging from 1 ppm to 34 ppm which are well below the OSHA permissible exposure limit of 50 PPM.

Noise: OSHA is monitoring the noise exposures of employees who perform (or work near) noisy operations such as jack hammering and drilling. To date the **79** samples collected indicate that employee noise exposures range from 73.7 dBA to 94.5 dBA. One personal sample and one area sample taken during core drilling operations have exceeded the applicable permissible exposure limit of 90 dBA. Accordingly, OSHA continues to recommend the use of appropriate hearing protection in noisy operations.

Total Dust (PNOR) A total of **92** samples (excluding bulk and blank samples) for total dust in and around the rubble pile were taken. Two samples were found to be in excess of the PEL for Total dust (15mg/m3). The highest exposure was found on one operator who was exposed at approximately 4X PEL.

Respirable Silica: The overwhelming majority of **375** silica samples (excluding bulk and blank samples) show no detectable levels of airborne silica. However, **twenty one** exposures exceeded the PEL. The highest sample result was approximately twenty one times the OSHA limit (pre-drillers working on the slurry or "bathtub" wall). The other twelve elevated exposures were approximately one to seven times the OSHA limit. These exposures occurred during: 1) jack hammering, 2) rubble removal and loading operations near the Winter Garden; 4) during the breaking up of concrete in the pit; 5) while core drilling the concrete slurry wall, and 6) while chipping concrete with power tools during demolition activities at 7 WTC's parking garage. Most of the work areas where apparent overexposures to silica occurred were in the rubble pile; an area where OSHA continues to encourage the use of respiratory protection.

Organic Compounds: OSHA has taken **506** samples (excluding bulk and blank samples) for (VOCs) such as acetaldehyde, acrolein, acrylonitrile, benzene, 2-butanone, carbofurans, PCBs, ethyl benzene, formaldehyde, Freon R-22 (chlorodiflouromethane), hexone, isocyanates (e.g. MDI, TDI), perchloroethylene, phosgene, styrene, toluene, 1-3 butadiene, trichloroethylene, vinyl chloride, glutaraldehyde, and xylene. Screening samples initially showed elevated levels of some organic chemicals resulting from the fires burning in the rubble pile. Subsequent personal and area samples show worker exposure levels to be below OSHA limits. However, one personal sample result for a benzene sample taken was found to be at the 8-hr. OSHA Allowable Limit concentration of 1 ppm. This was found on a backhoe operator moving debris on 10/7/01. See information below for polynuclear aromatics, Freon R-22, phosgene and dioxin.

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Inorganic Acids OSHA has taken approximately **45** samples for inorganic acids such as hydrochloric, phosphoric, and sulfuric acids. One sample for sulfuric acid was found to exceed OSHA's permissible exposure limit (PEL) of 1 mg/m^3. Additional sampling results are pending.

Oxides of Nitrogen/ Sulfur: Sampling on grappler operators on the rubble pile, and on employees at the truck wash stations revealed trace levels of nitric oxide and nitrogen dioxide. This was repeated (1) sample, now that the wash station is been enclosed. SO_2 personal and area results were found to be below OSHA limits.

Metals: OSHA has taken **784** samples (excluding bulk and blank samples) to monitor worker exposures to dusts, fumes, oxides, and other compounds of metals such as antimony, beryllium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, vanadium, zinc, cadmium, magnesium, and arsenic. Results from these samples are generally well below the applicable OSHA limits. However, torch cutting and burning structural steel at the rubble pile have resulted in instances of overexposures as follows: copper (12); iron oxide (23); lead (12); and cadmium (2). Accordingly, OSHA is recommending that workers engaged in these operations wear appropriate respiratory protection.

Mercury OSHA has taken **155** air samples for inorganic mercury. Results for **82** of those air samples have been received and no mercury was detected. Also, **36** bulk samples previously collected from rubble were re-analyzed for mercury. None was detected.

Ionizing Radiation: A survey of the rubble pile was conducted on 10/22-10/23 to check for latent radiation with particular attention to alpha radiation. Preliminary results show no elevated levels.

Dioxins: OSHA has taken **15** dioxin samples in the plume over hot spots in (and around the perimeter of) the rubble pile. Dioxin levels detected around the perimeter are lower than those found directly over the pile. To date, only one sample taken on the rubble pile showed dioxin levels which exceeded background levels. Dioxins are considered collectively as suspect human carcinogens. OSHA does not have a PEL for dioxins.

Polynuclear Aromatic Hydrocarbons OSHA has taken **132** samples. The majority of the samples have not shown the presence of benzo(a)pyrene and/or one or more of five additional fused polycyclic hydrocarbons: anthracene, acridine, pyrene, chrysene and phenanthrene. Sample results to date have identified eight samples which reached or exceeded OSHA's coal tar pitch volatile PEL of 0.2mg/m^3. These personal samples were taken on the pile on iron workers and grappler operators. OSHA continues to strongly recommend the use of respiratory protection when working on the rubble pile.

Freon R-22, Hydrogen Fluoride & Phosgene: OSHA has taken **137** samples for Freon R-22 (chlorodiflouromethane). The majority of sample results received to date show no detectable airborne levels. During operations involving Freon removal from the auxiliary chiller, direct reading instruments used by the entrants revealed readings ranging from 100 ppm to 500 ppm. SCBA 's were and are being worn by workers, and masks are to be worn only when direct reading instruments reveal 850 ppm Freon and/or less than 20.4% Oxygen. OSHA does not have an exposure limit for Freon R-22. (The NIOSH REL for Freon is 1000ppm..) Sampling for decomposition products of Freon R-22 for hydrofluoric acid (HF) and phosgene to date showed no detectable levels.

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