

New York City Mayor's Office of Emergency Management

Access Policy: Building Owners/Managers, Contractors, Residents – October 15, 2001

**Access Policy: Building Owners/Managers, Contractors,
and Residents as of October 15, 2001**

Procedure for Building Owners/Managers:

- Building owners/managers, with personal photo identification along with proof of ownership of building (e.g. deed, ground lease) or right to occupy same, or other proof of authority to act on the owner's behalf, must meet with the contractor(s) at the NYPD access van located at Broadway and Fulton Streets.
- Building owners/managers and contractor(s) will be interviewed by an NYPD official in charge at which time they will present all required ID and building credentials.
- Owner or managing agent will be required to sign a police release form issued by NYPD whereby owner assumes liability for the building, its contents, and occupants.
- Upon NYPD's satisfaction of proof of ownership/management authority, and all required photo ID's, NYPD may, in its sole discretion make arrangements with the owner and contractor(s) to provide access at the established checkpoint.

Procedure for Contractors:

- Contractors will be granted access provided the owner or superintendent of the building accompanies them to where work is to be done. In addition, contractors must show photo ID and provide a list of all workers and social security numbers that will be working on site.
- All workers must have photo ID and ID establishing its employment by the contractor (including SS#). Upon NYPD satisfaction of identification, the contractor and owner or superintendent will be escorted to the site.
- The contractor is responsible for assembling the entire work crew at the established checkpoint at the appointed time.
- NYPD may allow vehicle access for work crews and equipment on West Street on a case-by-case basis.
- This Work Crew access Procedure will be repeated each day access is required.
- Contractors and their work crews are to remain at the specified work location. Any deviations will result in removal from the area and any further requests for access will be denied.

Procedure for Contractor(s) Work Crews, Vehicles & Equipment:

- The contractor is responsible for assembling all vehicles requiring access for the workday at South and Pike Streets.
- Contractor's crew chief will then go to the access van at Broadway and Fulton Streets and notify the NYPD inspector in charge that all vehicles are ready and waiting at South Street.
- The crew chief will then ride with NYPD to South and Pike Streets where all vehicles will be inspected and all personnel ID will be checked.

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- Upon NYPD's inspection and approval of vehicles and personnel, NYPD will escort the contractor's vehicles to a checkpoint at the perimeter of the restricted area.
- Any other personnel joining the crew at that time will have to present proper ID at that point.
- Contractor(s) may be required to undergo another overall vehicle and ID check at that time.
- Once NYPD is satisfied and clears the vehicles and personnel for admission into the restricted area, NYPD will escort the contractor vehicle(s) to the worksite.
- This procedure must be followed each and every time the contractor requires vehicular access to the site.

Procedure for Residents:

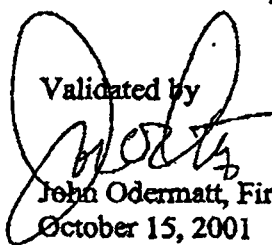
- Residents must show proof of residency and photo ID to access their apartments. Upon NYPD satisfaction of residency, each resident will be escorted by NYPD officers to their apartments and allowed 15 minutes to gather belongings and then residents must vacate the premises.
- Initial vehicle access is required by NYPD at South Street and Catherine.
- Access to this area is located at Battery Place and West Street.

Access to the Battery Park City Area:

- Battery Park City Zone from Battery Place to Liberty Street, West Street to Hudson River. Within this area, Liberty Street to Rector Place is a frozen zone and access will be granted on a case-by-case basis. BPC North residents should enter at Chambers & West and walk down the foot path and BPC South residents should enter at Battery Park Place and West.
- Residents and Contractors can access buildings South of Rector Place.
- NYC Parks Police are permitted to enter Battery Park City & the North Cove area only. Access to the Red Zone is prohibited.

Economic Development Hotline (718) 403-2220

Validated by



John Odermatt, First Deputy Director

October 15, 2001



The Mayor's Office of Emergency Management, City of New York

To: All Agencies
From: John Odermatt, 1st Deputy Director, OEM
Date: Monday, October 15, 2001

THIS UPDATED MEMORANDUM CONTAINS THE FOLLOWING:

- Red Zone Access Policy
- Red Zone Security Policy-(Exempt Agencies)
- Access Policy: Building Owners/Managers, Contractors and Residents

Red Zone Access Policy as of October 15, 2001

The Red Zone is the fenced in area from Murray St. (on the north) to Rector (on the south), and from the Hudson River to Broadway. West St. between Chambers and Murray is still frozen. Note: Battery Park City is not part of the Red Zone, as pedestrians and businesses may enter with identification.

The only access to the Red Zone (pedestrian or vehicular) will be at the following locations:

- West St. and Chambers St. (for pedestrian and vehicle access)
- Church St. and Chambers St. (for pedestrian and vehicle access)
- Murray St. and Broadway (for vehicle access only)
- Trinity St. and Rector St. (for vehicle access only)
- West and Rector (for pedestrian and vehicle access)

Certain agencies, as listed on the Security Policy as "Exempt Agencies", can gain access to the Red Zone with their agency ID., and another form of photo identification. All agencies not included as "exempt" must provide lists of personnel requiring access to the OEM credentialing officer who will approve it and fax it to the credentialing checkpoint at West and Chambers.

Note: Some agencies may be issued bulk credentials (e.g. The FDNY staging officer at Chelsea Piers) so that they can expedite the entry of critical employees. Those agencies will be responsible for accounting for those credentials.

The checkpoint at West and Canal will be in radio contact with IS-89 to let vehicles seeking credentials through to IS-89

*New York City Mayor's Office of Emergency Management
Red Zone Access Policy – October 15, 2001*

- **Valid Passes:** The White Pass or a Red Z on the WTC 2001 Photo ID are valid passes for access in the Red Zone. Agencies should inform their personnel that Red Zone access is for official business only and that unauthorized visits could lead to arrests and prosecution.
 - **WTC 2001 Photo ID:** As of October 1, 2001, only personnel working at OEM's Emergency Operations Center will receive a WTC 2001 Photo ID. All other essential personnel who need access to the Red Zone will be issued a White Pass. Some personnel have previously received the WTC Photo IDs – these individuals may continue to use these credentials to access the site as necessary.
- Personnel not included under the Red Zone Security Policy-(Exempt Agencies) must request credentials through the agency that needs them in the area. That agency in turn should request Red Zone access through OEM functional group leaders or the credentialing officer at the OEM Operational Center at the podium.
- Agencies utilizing contractors directly involved in the response and recovery within the Red Zone should provide OEM with a list of names and social security numbers for approval. Once approval has been granted, OEM will fax all pertinent information to the credentialing post at IS 89 at Chambers and West.
- Contractors not directly involved in the response and recovery effort will NOT be issued white badges. If they want to request a NYPD escort into the Red Zone, they should go to one of the NYPD walk-in center/command posts.
 - NYPD at Fulton & Broadway (917) 769-2457 or 2468 or 2469
 - NYPD at Battery Place and First Place (917) 769-4049 or 2929
 - NYPD at Pike & South Streets (917) 769-2958

(See attached "Access Policy for Building Owners/Managers, Contractors, and Residents").
- At Canal St. checkpoints, consideration should be given to staff and patients trying to access NYU Downtown Hospital located at Williams St. and Beckman St. However, those personnel will not be permitted into the Red Zone.

VEHICLES

- Private vehicles are not permitted in the Red Zone. Properly credentialed agency personnel with official agency vehicles may be permitted to enter, pending traffic conditions.
- Buses are allowed to continue on regularly scheduled routes throughout downtown so long as they are outside of the Red Zone.

*New York City Mayor's Office of Emergency Management
Red Zone Access Policy – October 15, 2001*

SPECIAL NEEDS

Any marked Access-A-Ride (MTA's paratransit division) and/or marked private ambulette van or sedan will be permitted to enter any areas open to pedestrian re-entry even if private vehicular traffic is still restricted. These vehicles are transporting persons with disabilities to/from locations open to them as members of the public. Home Care Attendants, Home Health Aids, and Visiting Nurses with clients in the re-entry areas are permitted to enter but may be asked for two forms of identifications (one personal photo ID and agency ID).

CIVILIAN EXEMPTIONS

The following exemptions should be noted:

- Employees of the Mercantile Exchange, Merrill Lynch and Brookfield Properties may enter Battery Park City North with residents and be permitted to walk down the footpath.
- Brookfield employees also may enter at the Battery Park Place/West Street entrance to access 4 World Financial Center.
- Employees of Solomon Smith Barney and Citibank will be permitted to access Battery Park City North so that they can access the NY Waterways Ferry.

BATTERY PARK CITY

- Residents at Battery Park City may enter with two forms of identification. BPC North residents should enter at Chambers and West and walk down the foot path
- BPC South residents should enter at Battery Park Pl and West.



The Mayor's Office of Emergency Management, City of New York

Red Zone Security Policy-(Exempt Agencies)

As of October 15, 2001

As per John Odermatt, First Deputy Director for the Mayor's Office of Emergency Management: The following agencies will be allowed into the Red Zone with only their agency ID and a secondary piece of identification OR their agency badges and their picture agency ID. All other personnel on official business will need a WTC 2001 picture credential with the Red Z or a Mayor's Office of Emergency Management (white pass). If the Z is punched out, authorization into the Red Zone has been revoked.

Exempt Agencies

Note: Additions and deletions may have been made!

City of New York

*OEM

*FDNY (They will be wearing an additional plastic, colored ID band, & not required any additional ID).

*NYPD

FNDY-EMS

NYC Department of Transportation

Department of Environmental Protection

Department of Sanitation

Office of the Chief Medical Examiner

*New York City Sheriff

*Department of Probation

Board of Education

Department of Design and Construction

State

State Emergency Management Office (SEMO)

*New York State Police

*NYS DEC Police

*Port Authority

*MTA Police Department

MTA - New York City Transit

New York State EMS Ambulances

School Construction Authority

Federal

Bureau of Alcohol Tobacco and Firearms

U.S. Secret Service

FBI

National Transportation Safety Board (NTSB)

Immigration and Naturalization Service

US Coast Guard

US EPA

Federal Emergency Management Agency +

USAR

Disaster Mortuary Assistance Teams

Disaster Medical Assistance Teams

National Disaster Medical System

Occupational Safety and Health Administration

US Public Health Service

US Customs

Veterinary Medical Assistance Teams

*United State Postal Services Investigators

*Federal Reserve Bank Police

Private

American Red Cross

Salvation Army

AT&T/Wireless (plus contractors with agency ID)

ConEd (plus contractors with agency ID)

Verizon (plus contractors with Verizon ID, including Empire City Subways)

*Denotes Escort Authority so agency personnel may freely escort those without credentials into the Red Zone.

OCT-16-2001 15:53

US ENV PROTECTION AGENCY

732 321 4425

P.02/24

U.S. Environmental Protection Agency (www.epa.gov)
Air / Bulk / Wipe/ Water Sampling Situation Report
Tuesday, October 16, 2001 (12:00 noon)

Fixed Ambient Air Sampling Locations (Asbestos)

- NYC / ER (Oct 12, 0001 to 1200 hrs)
 - Resubmittal of results from Sunday, October 14 Sampling Situation Report with additional data for two stations (Locations I and Q) previously not reported.
 - Additional 2 samples analyzed were below the TEM AHERA standard.
- NYC / ER (Oct 12, 1200 to 2400 hrs)
 - All 20 samples analyzed were below the TEM AHERA standard.
- NYC / ER (Oct 13, 0001 to 1200 hrs)
 - All 20 samples analyzed were below the TEM AHERA standard.
- NYC / ER (Oct 13, 1200 to 2400 hrs)
 - All 20 samples analyzed were below the TEM AHERA standard.
- NYC / ER (Oct 14, 1200 to 2400 hrs)
 - All 20 samples analyzed were below the TEM AHERA standard.
- NYC / ER (Oct 15, 0001 to ¹²2400 hrs)
 - All 17 samples analyzed were below the TEM AHERA standard.
 - No results available for 3 additional samples due to pump failure from rain.
- NJ (Oct 12)
 - All 4 samples analyzed were below the TEM AHERA standard.
- NJ (Oct 13)
 - All 4 samples analyzed were below the TEM AHERA standard.
- NJ (Oct 14)
 - All 4 samples analyzed were below the TEM AHERA standard.

Landfill Ambient Air Sampling Locations

- Fresh Kills (Oct 9, 0630 - 2000 hrs) - Asbestos
 - All 17 samples were below the TEM AHERA standard.

www.

OCT-16-2001 15:53

US ENV PROTECTION AGENCY

732 321 4425

P.03/24

- Fresh Kills (Oct 13, 0600 - 1900 hrs) - Asbestos
 - All 17 samples were below the TEM AHERA standard.
- Fresh Kills (Oct 13, 1800 - Oct 14, 0700 hrs) - Asbestos
 - All 16 samples were below the TEM AHERA standard.
 - No results available for 1 additional sample since a volume was not recorded.
- Fresh Kills (Oct 14, 0630 - 2000 hrs) - Asbestos
 - All 17 samples were below the TEM AHERA standard.
- Fresh Kills (Oct 14) - Particulate Monitoring (Dataram)
 - General overall decrease in readings from previously reported data based on daily average concentration.
- Fresh Kills (Oct 15) - Particulate Monitoring (Dataram)
 - General overall decrease in readings from previously reported data based on daily average concentration.

Ambient Air Sampling Locations

- NYC / ER (Oct 15) - Volatile organics (TAGA)
 - Benzene exceeded OSHA TWA PEL at two locations on the debris pile in the plume at ground level.
 - South Tower (debris pile) location shows significant reduction of overall concentrations of volatile organic compounds previously detected, including benzene.

Bulk/Dust Samples

- NYC / ER (Sep 26)
 - 1 sample obtained from the lobby of 110 Greenwich did not detect any PCBs.

Revised – 10/16/01

**NEW YORK METROPOLITAN
COUNTER-TERRORISM COMMITTEE
INCIDENT RESPONSE SUB-COMMITTEE**

MISSION

...to examine issues and make recommendations related to the timely, coordinated and effective initial response and sustained operations by city, county, state and federal emergency services agencies to address a suspected or actual terrorist attack within the City of New York, with a special focus on attacks involving Weapons of Mass Destruction (WMD).

GOALS

- Develop and advance for implementation a Mayoral Executive Order specifying use of the nationally recognized Incident Command System by all city agencies and propose notional structures for “Unified Command” under various response scenarios.
- Collect and assess lessons learned from all emergency service agencies resulting from the September 11, 2001 response to the World Trade Center Attack. Refine a priority set of discrete issues and formulate recommendations for changes in response protocols, organization, equipment and training.
- Identify a set of possible terrorist scenarios and war-game these to evaluate the effectiveness of changes recommend as outlined above.
- Inventory the current level of WMD response capability across all agencies within New York metropolitan region and make recommendations for enhancing these capabilities as required.

**EMERGENCY ON-SITE
HOTLINE**

212-747-9193

**PHONE IS MANNED 24/7 AT
FIRE OPERATIONS CENTER
LOCATED AT 10/10 FIRE
STATION
(LIBERTY & GREENWICH)**



Industrial Hygiene Air Sample Results

Summary for Weeks of 11/25 and 12/2

Attached is a summary of the results of the samples collected by ATC associates at the World Trade Center site for the specified weeks.

Sampling for hydrogen sulfide around the area of the south bridge was begun during the week of 12/2. This area has been a source of frequent complaints about "rotten egg" odor. Out of the 8 samples collected in that area, one sample showed a concentration of 16 ppm, which is below the OSHA ceiling PEL of 20 ppm, but above the 8 hour TLV of 10 ppm. This was an area sample taken near a suspected odor source (a storm sewer opening) so it does not represent worker exposure. However, in response to this elevated result, we have included both personal and area samples for hydrogen sulfide in our sampling plan. The results of the other samples collected in the area were either very low or too low to be quantified.

The vast majority of the samples collected by ATC are "personal samples", meaning that the worker wore the sampling device. The vast majority of results have shown exposure levels to be below occupational exposure limits. The exceptions were:

- A lead concentration of 2.3 times the PEL on a grappeler operator on 10/17
- A quartz concentration of 5 times the PEL on a laborer during concrete demolition on 11/16
- A quartz concentration of 1.5 times the PEL on concrete mixer operator on 11/19

Following is an explanation of the columns in the attached summary:

Agent Class - This column includes general category of the agents (substances) which were sampled.

of Samples - This indicates how many individual samples were collected for the agent class listed.

of Analytes - This is the number of individual analysis performed. If only one analyze is determined on each sample, then the number of analytes will equal the number of samples. However, most samples are analyzed for more than one agent as follows:

Metals: Aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, selenium, silver, thallium, tin, titanium, vanadium, and zinc. Metal samples are sometimes also analyzed for total particulate.

PAHs: Acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benz(b)fluoranthene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene.

Aromatics: Benzene, ethyl benzene, toluene, and xylene.

Silica: Respirable dust, quartz, and cristobalite.

Aldehydes: Acetaldehyde, acrolein, benzaldehyde, formaldehyde, n-butyraldehyde, propionaldehyde, and valeraldehyde.

Acids: Hydrobromic acid, hydrochloric acid, hydrofluoric acid, nitric acid, phosphoric acid and sulfuric acid



Industrial Hygiene Air Sample Results

Summary for Weeks of 11/25 and 12/2

Highest Analyte - The analyte found in the highest concentration with respect to its occupational exposure limit.

Highest Result - The concentration of the highest analyte.

OSHA PEL - This is the Permissible Exposure Limit (PEL) for the highest analyte. PELs are established by an OSHA rule-making process and are the legal occupational exposure standards.

ACGIH TLV - This is the Threshold Limit Value (TLV) for the highest analyte. TLVs are voluntary guidelines for occupational exposure which are established by the American Conference of Governmental Industrial Hygienists, a private professional organization.

Highest Result / % of OEL - This is the percentage of the occupational exposure limit (OEL) that the highest result represents. This is the value in the "Highest Result" column divided by the lower of either the PEL or TLV and converted to a percentage.

#of NQs - This is the number of analyses that reported that concentration as "not quantifiable" (NQ).

% of NQ - This is the percent of the total analyses which were reported as "not quantifiable".

If you have any questions concerning this information or would like further details about these results, feel free to contact the Liberty Mutual Industrial Hygienist on duty @ 917-566-2576.

Mike Ramsey, CSP, CIH
Senior Industrial Hygienist
Liberty Mutual Insurance Group

12/20/01

Liberty Mutual / ATC Measurement Data

Weekly Summary

Week of:	Agent Class	# of Samples	# of Analyses	Highest Analyte	Highest Result	OSHA PEL	ACGIH TLV	Highest Result % of OEL	Job with Highest Exposure	# of NQs	% NQ	Comments
11/25/01	Total Dust/Metals	17	340	Cadmium	2.8 ug/m3	5 ug/m3	10 ug/m3	58% of PEL	Torch Cutter	198	58%	
11/25/01	Resp. Dust/Silica	13	39	Quartz	0.018 mg/m3	0.1 mg/m3*	0.05 mg/m3	38% of TLV	Spotter	27	69%	
11/25/01	Aromatics	7	28	Toluene	0.0038 ppm	200 ppm	50 ppm	0.0076% of TLV	Torch Cutter	26	93%	
11/25/01	Aldehydes	3	21	Formaldehyde	0.010 ppm	0.75 ppm	0.3 ppm (Ceiling)	1.3% of PEL	Backhoe Operator	15	71%	
11/25/01	PAHs	6	96	Total PAHs	6.8 ug/m3	200 ug/m3	200 ug/m3	3.4% of PEL	Grappler Operator	75	78%	
11/25/01	Asbestos	24	24	Fibers	0.033 f/cc	0.1 f/cc	0.1 f/cc	33% of PEL	Spotter	4	17%	
11/25/01	Acids	6	36	Hydrofluoric Acid	0.01 ppm	3 ppm	3 ppm (Ceiling)	0.33% of TLV	Grappler Operator	59	164%	
11/25/01	Ozone	2	2	N/A				All "Too Low to Quantify"		2	100%	
11/25/01	Carbon Monoxide (TWA)	26	26	Carbon Monoxide	33 ppm	50 ppm	25 ppm	132% of TLV (abbreviated sample - 2 hrs, 9 min)	Flagman	15	58%	1 peak over NIOSH Ceiling of 200 ppm (Grappler Operator)
Totals:		104	612									
12/1/01	Total Dust/Metals	10	202	Arsenic	1 ug/m3	10 ug/m3	10 ug/m3	10% of PEL	Torch Cutter	122	80%	
12/1/01	Resp. Dust/Silica	8	24	Respirable Dust	0.34 mg/m3	5 mg/m3	3 mg/m3	11% of TLV	Equipment Operator	19	79%	
12/1/01	Aromatics	12	48	Benzene	0.0032 ppm	1 ppm	0.5 ppm	0.64% of TLV	Equipment Operator	31	65%	
12/1/01	Aldehydes	6	42	Formaldehyde	0.017 ppm	0.75 ppm	0.3 ppm (Ceiling)	2.3% of PEL	Equipment Operator	29	89%	
12/1/01	PAHs	6	96	Total PAHs	17 ug/m3	200 ug/m3	200 ug/m3	8.5% of PEL	Torch Cutter	52	54%	
12/1/01	Asbestos	26	26	Fibers	0.048	0.1 f/cc	0.1 f/cc	48% of PEL	Spotter	5	19%	
12/1/01	Acids	6	36	Sulfuric Acid	0.059 mg/m3	1 mg/m3	1 mg/m3	5.9% of PEL	Grappler Operator	31	86%	
12/1/01	Ozone	8	8	N/A				All "Too Low to Quantify"		8	100%	
12/1/01	Carbon Monoxide (TWA)	18	18	Carbon Monoxide	5 ppm	50 ppm	25 ppm	20% of TLV	Torch Cutter	14	78%	
12/1/01	Hydrogen Sulfide	8	8	Hydrogen Sulfide	16 ppm	20 ppm (Ceiling)	10 ppm	180% of TLV (Area Sample)	SW Corner, near south bridge	5	63%	
12/1/01	Diesel Fume	11	11	Inorganic Carbon	0.075 mg/m3	3.5 mg/m3	3.5 mg/m3	2.2 % of PEL	Torch Cutter	1	9%	
Totals:		108	508									

Notes:

The PEL for quartz is determined by the formula $PEL = 10 \text{ mg/m}^3 / (\% \text{ quartz} + 2)$. For dusts with high quartz content this works out to be a quartz concentration of approximately 0.1 mg/m3.

"OEL" = "occupational exposure limit". A generic term encompassing PELs, TLVs and other workplace exposure limits.

"NQ" = "not quantifiable". Substance was not present in sufficient quantity in the sample to report a firm value for the concentration. All quantification levels for the sampling methods used are well below occupational exposure limits.

The area samples for hydrogen sulfide were taken near suspected sources and were not representative of worker exposure.

OSHA SAMPLING RESULTS SUMMARY AS OF 12/20

Asbestos:	A total of 872 air monitoring 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 .1 f/cc. After 9/21, sampling focused on the rubble pile and those workers working on or immediately next to it. 82 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 77 personal samples of workers on the rubble pile showed results ranging from 1 ppm to 34 ppm which are well below the OSHA 50 ppm permissible exposure limit.
Noise:	OSHA has been conducting noise monitoring in the rubble pile. 41 personal samples have been conducted on employees performing (or working near) various operations such as jack hammering, drilling and equipment operations. Employee's exposure to the noise range from 73.7 dBA to 94.5 dBA. OSHA's permissible noise exposure for construction is 90 dBA. One personal sample and one area sample during core drilling operations exceeded the OSHA noise PEL of 90 dBA. OSHA continues to recommend the use of appropriate hearing protection for workers performing tasks where high noise levels are likely to be encountered.
Respirable Silica:	The overwhelming majority of the 402 silica samples show no detectable levels of airborne silica. However, fourteen exposures exceeded the PEL. The highest sample result was approximately nine 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) rubble removal and loading operations near the Winter Garden; 2) during the breaking up of concrete in the pit; 3) while core drilling the concrete slurry wall, and 4) 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.
Volatile Organic Compounds:	OSHA has taken 608 samples for (VOCs) such as acetaldehyde, acrolein, acrylonitrile, benzene, 2-butanone, carbofurans, chlorodiphenyl (PCB), ethyl benzene, formaldehyde, Freon R-22 (chlorodifluoromethane), 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 benzene was found to be at the 8-hr. OSHA Allowable Limit concentration of 1 ppm. This was found on a backhoe operator moving debris. See information below for polynuclear aromatics, Freon R-22, phosgene and dioxin.
Oxides of Nitrogen/ Sulfur:	Sampling on grappler operators on the rubble pile, and on employees manning truck wash stations revealed trace levels of nitric oxide and nitrogen dioxide. SO ₂ personal and area results were found to be below OSHA limits.

Metals: OSHA has taken 626 air 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, arsenic, and mercury. 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 (9); iron oxide (20); lead (12); and cadmium (2). Accordingly, OSHA is recommending that workers engaged in these operations wear appropriate respiratory protection.

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 samples for dioxin and these samples were analyzed by EPA. One initial sample, representing exposure directly on the pile, showed elevated levels of dioxins when compared to ambient background levels. This value was comparable to the levels found by EPA sampling. The dioxins at this location are being emitted from the on-going rubble fire. Additional sampling was conducted around the perimeter of the pile and revealed levels that were considerably lower than those on the rubble pile. Dioxins are considered collectively as suspect human carcinogens. OSHA does not have a worker standard for dioxins. OSHA is coordinating with EPA, and the Salt Lake City Analytical Laboratory to fully assess the risk posed by the elevated levels of 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 seven samples which reached or exceeded OSHA's coal tar pitch volatile PEL of $0.2\text{mg}/\text{m}^3$. These personal samples were taken on the pile on iron workers and grappeler 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 105 samples for Freon R-22 (chlorodifluoromethane). The majority of sample results received to December 17th reveal non-detectable airborne levels. During operations involving Freon removal from the auxiliary chiller that started on 12/5/01, direct reading instrument revealed readings ranging from 100 ppm to one peak near a leaky valve of 500 ppm. SCBA tanks 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.) In response to information about exposure to the decomposition by-products of Freon R-22 used in the air conditioning systems of WTC towers, sampling for hydrofluoric acid (HF) had been conducted. Results for HF revealed non-detectable levels. Sample results for phosgene to date show non-detectable levels.

Crystalline Silica Exposure in the Construction Industry Occupational Safety and Health Administration U.S. Department of Labor



Health Hazard Information Card

• What is crystalline silica (quartz)?

The terms "crystalline silica" and "quartz" refer to the same thing. Crystalline silica is a natural constituent of the earth's crust and is a basic component of sand and granite.

• What is silicosis?

Silicosis is a disease of the lungs due to breathing of dust containing crystalline silica particles. This dust can cause fibrosis or scar tissue formations in the lungs that reduce the lung's ability to work to extract oxygen from the air. There is no cure for this disease, thus, prevention is the only answer.

• What are the symptoms of silicosis?

There are several stages of silicosis. Early stages may go completely unnoticed. Continued exposure may result in the exposed person noticing a shortness of breath upon exercising, possible fever and occasionally bluish skin at the ear lobes or lips. Silicosis makes a person more susceptible to infectious diseases of the lungs like tuberculosis. Progression of the disease leads to fatigue, extreme shortness of breath, loss of appetite, pain in the chest, and respiratory failure, which all may lead eventually to death. Acute silicosis may develop after short periods of exposure. Chronic silicosis usually occurs after 10 or more years of exposure to lower levels of quartz.

• Where are construction workers exposed to crystalline silica dust?

The most severe exposures to crystalline silica result from sandblasting to remove paint and rust from stone buildings, metal bridges, tanks, and other surfaces. Other activities that may produce crystalline silica dust include jack hammering, rock/well drilling, concrete mixing, concrete drilling, and brick and concrete block cutting and sawing. Tunneling operations; repair or replacement of linings of rotary kilns and cupola furnaces; and setting, laying, and repair of railroad track are potential sources of crystalline silica exposure.

Crystalline Silica Exposure in the Construction Industry Occupational Safety and Health Administration U.S. Department of Labor



Health Hazard Information Card

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● How is OSHA addressing exposure to crystalline silica-containing dust?

OSHA has established a Permissible Exposure Limit, or PEL, which is the maximum amount of airborne crystalline silica that an employee may be exposed to during a work-shift. OSHA is also beginning a Special Emphasis Program to inform employers and employees about the occurrence and hazards of crystalline silica and ways to reduce exposure to the dust.

● What can employees do to limit their exposure to crystalline silica?

- Employers are required to provide and assure the use of appropriate controls for crystalline silica-containing dust. Be sure to use all available engineering controls such as water sprays and ventilation of containment structures. Substitution of less hazardous materials can also be used.

- Be aware of the health effects of crystalline silica and that smoking adds to the damage.

- Know the work operations where exposure to crystalline silica may occur.

- Participate in any air monitoring or training programs offered by the employer.

- Use type CE positive pressure abrasive blasting respirators for sandblasting.

- For other operations where respirators may be required, wear a respirator approved for protection against crystalline silica-containing dust. Do not alter the respirator in any way. Workers who use tight-fitting respirators cannot have beards/mustaches which interfere with the respirator seal to the face.

- If possible, change into disposable or washable work clothes at the worksite; shower (where available) and change into clean clothing before leaving the worksite.

- Do not eat, drink, use tobacco products, or apply cosmetics in areas where there is dust containing crystalline silica.

- Wash hands and face before eating, drinking, smoking, or applying cosmetics outside of the exposure area.

If you have any questions about any occupational health matter, feel free to ask us. Our job is to protect your health. For more information, contact your local or Regional OSHA office (listed in the telephone directory under United States Government - Department of Labor - Occupational Safety and Health Administration).

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WTC Daily Safety Report



Report Period: 24 hours beginning 7:30 AM on

December 20th, 2001

Obseervation/Hazard	Location	Corrective Action Required	CM Person Contacted	CM Response
Drillers working on NW slurry wall in pit without respiratory protection	AMEC	Require respiratory protection in pit.	Paul Difrenna	Open. Issue was mentioned to workers in area as well as Paul Difrenna. He stated that he will address the matter.
AMEX building on 4th floor. Temporary lighting is spliced with plug outlets.	AMEC	Temporary lighting should be improved and wired separately from temporary power.	Paul Difrenna	Open. Will look into improvement.
Fall potential at hole east of WTC 6 location. Leading edge of recently collapsed building	AMEC	Limit personnel access. Area needs to be protected until subsequent demolition is accomplished.	Ray Master	Pending. Will limit access until the remainder of WTC 6 fills the hole.
Cleveland tieback workers on wearing respirators.	Amec	Have workers wear respirators.	Jeff Melofchick	Closed
Falls from elevation- laborer at 2nd level of AMEX building	AMEC	When working at elevations of 6' or more and outside of guardrail must have PFA system	Duane Matters	Closed- laborer tied off to retractible lifeline provided.
Two DDC engineers in chiller area lacking Eye Protection.	AMEC area near chiller field	Use proper PPE.	Names not given. Refused. Hard hat was marked "Topo"	Open. Refused to comply. Stated they wouldn't leave the site to retrieve glasses. Stated they would wear them in the future.
Iron worker not wearing respirator.	AMEC by wtc 6	Have workers wear respirators.	Jeff Melofchick	Closed
Jersey barriers are not completely around opening and three were not on solid ground.	Amec by WTC 6 and Vessey	Place jersey barriers around opening and on solid surface.	Jeff Melofchick	Open - Spoke to Jon who placed saw horses and tape around the open until morning at which time he indicated the barriers would be moved.
Hydro barriers rolled over and not protecting opening.	Amec by WTC 6 and Vessey	Upright barriers and replace caution tape.	Jeff Melofchick	Closed - Barriers where uprighted and caution tape placed around them.
Mazzocchi Grappler operator was not using his respirator.	Amec in the pit area	Grappler operators need to wear PPE.	Jeff Melofchick	Closed - Corrected on the spot.
Truck Driver for Grace not wearing hard hat outside of vehicle.	Amec on Vessey	Operators outside of vehicles in the construction zone should wear PPE.	Jeff Melofchick	Closed - Operator put PPE on his head.
Seven workers in the AMEC area where not wearing PPE.	AMEC Winter Garden	Have workers utilize respiratory protection.	Paul Difrenna	Open. Concrete chippers (Mazzocchi Laborers) working without respirators. Spoke to crew, foreman was not present. Spoke to Paul Difrenna. He stated that he will address the matter.
Cleveland Drilling crew in pit not wearing PPE (respirators and safety glasses)	AMEC/ Cleveland	Everyone inside slurry wall is required to wear respirators and safety glasses	Duane Matters	Open. Spoke with John, Cleveland foreman. Said he would have his crew wear this. Checked an hour later and half the crew was still without PPE
Mazzocchi operators refuse to wear respirators (# A26, A11, A21, A27)	AMEC/ Mazzocchi	Grappler operators need to wear PPE.	Duane Matters	Open, spoke with Chris at DDC and he spoke with John, Mazzocchi Supt.
Fall hazard for surveyors at S.West corner of slurry wall	Bovis	Create safe work platform with handrails for surveyors	Ray Master	Open. R. Master stated he is considering a work platform with limited access with handrails
Hot work on one of the main chiller tank on 12/18. Potential acid gas exposure from residual Freon-22.	BOVIS	York agreed (12/19) to submit a written procedure for tank removal discussing the recommended means and methods. DDC, LM and BOVIS will review and establish action plan for worker protection.	Brian Peters and Ray Master	Open. Plan being developed. Hot work permit will be issued for other torch work in chiller area. Tanks are not to be cut with torches.
Jersey barriers of West slurry wall (southern side) lacking walk path for top access. Creating difficult walk/work area	Bovis	Increase distance between slurry wall and Jersey barrier. Some barriers are lacking horizontal life lines.	Bill Ryan	Open. Actual movement of barriers is scheduled by Tully. Tully waiting for generators to be moved.

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Cable ends on tie back systems are unprotected and unmarked. Employees could injure themselves against these.	Bovis	Cover and mark all cable ends on tiebacks until they can be cut off.	R. Master	Pending. Work was ongoing at end of shift.
Some operators and Nicholson workers stated they were not aware of worker orientation	Bovis	Schedule orientation training for workers.	Ray Master	Pending. R. Master stated he is scheduling orientation sessions. Need to get dates from R. Master
1000 ton crane wind meter is not working.	Bovis	Repair wind meter.	Al Parmett	Open
Open trench near slurry wall poses a fall exposure.	Bovis	Place barricades around the trench.	Al Parmett	Closed - Placed a barricade around it and had a worker directing traffic around the trench.
Grace truck #71 operator was not wearing a respirator while the truck was being loaded on the pile.	Bovis	Wear respirators when in the pile area.	Al Parmett	Open - Spoke to Bovis supervisor. He instructed the operator to put it on. After break and a second check the operator was not wearing it after second check. Grace Supervision needs to set the example
Gateway Demo #3 excavator operator was not wearing his PPE on the pile.	Bovis	Wear respirators when in the pile area.	Al Parmett	Closed - Spoke to supervisor and he corrected operator who wore PPE through shift.
Grace Ind Hitachi excavator operator EX 550 LC and Hitachi grapppler ex 1200 was not wearing respirator while on the pile.	Bovis	Wear respirators when in the pile area.	Al Parmett	Closed - Spoke to Bovis supervisor who corrected the worker.
Replace broken jersey barrier along the south slurry wall. Fence is ready to fall onto workers.	Bovis	Repair or replace barrier	Al Parmett	Open
Operator of truck mounted jack hammer for grace industries was not wearing respirators.	Bovis	Wear respirators when in the pile area.	Al Parmett	Closed - Bovis supervisor corrected operator who wore respirator the rest of the shift.
More dust control needed	Bovis	Provide water trucks in dusty and smoky areas	Kathy Moseley	Closed
Lack of PPE usage with potential exposure	Bovis - (Nicholson)	Enforce PPE usage and discipline policy	R. Master	Open
Angel Ariel truck #31 is missing driver side headlight.	Bovis.	Replace headlight.	Ray Master	Open. Recommendation was left with R. Master as he was unavailable.
Eating and drinking in debris area causing potential for illness.	Bovis. Debris Area	Do not eat, drink or smoke in the debris area of the project.	Ray Master	Open. Recommendation was left with R. Master as he was unavailable.
Grace compressed gas cylinders on debris pile creating hazard for explosion or impact injuries.	Bovis. Debris Area	Cap cylinders and removed them from pile. Place into a cage.	Mike Meddin	Closed. Item abated upon request.
Lack of respirator usage by Grace operators (EX 1200, #235 hoe ram), spotters and oiler in pit.	Bovis/ Grace	All employees inside slurry wall area to wear respirators	Kathy Moseley	Closed. Kathy addressed with Grace supt.
Cutting station on West Street. Wind was grabbing the tarp. Potential for collapse. Scaffold was rocking.	Cutting station on West Street. AMEC	Anchors should be improved.	Paul Difrenna	Open. Will improve anchors when scaffold is moved one street over, by end of week.
Fall into an open trench by workers passing by the trench at night and during the day. New Trenching imposes hazard for walkers. Area cannot be cut off except by DDC.	Tully	Cover the trench. Light the area.	Mike Marisco	Closed on second shift.
Fall potential at South slurry wall - chain link fence missing from top of one jersey barrier. Area being used as access point to slurry wall with trades climbing over jersey barrier which increases the potential of a fall.	Tully	Reinstall chain link fencing to prevent access.	Bill Ryan	Open -Foreman will contact superintendent to correct situation. Second shift reviewed with Ed Davis, should be corrected by tomorrow. Not corrected as of today (12/20). Additional missing section on east slurry wall.

WTC Daily Safety Report



Report Period: 24 hours beginning 7:30 AM on

December 20th, 2001

Observation/Hazard	Location	Corrective Action Required	CM Person Contacted	CM Response
Jersey wall on East slurry wall needs to be moved away from edge.	Tully	Increase distance between edge and Jersey barrier	Bill Ryan	Open. Second barrier condition was found along east slurry wall. B. Ryan will contact Ingersoll Rand to move generator which is in the way.
Three operators in pit without respirators.	Tully	Have workers wear respirators.	Ray Lekstusis	Closed
Fall from elevation hazard (20') at 130 Liberty Bldg, 2nd floor atrium area	Tully	Perimeter guardrails needed	Ray Lekstusis	Open
Poor housekeeping in the Plaza maintenance area- trip hazards, unsecured gas cylinders	Tully	Improve housekeeping, secure gas cylinders	Bill Ryan	Open, Bill Ryan said this will be abated by noon today
Fall from elevation hazard-SE corner of slurry wall.	Tully	Need to close off corner of ramp with fall protection (barrier wall)	Ray Lekstusis	Open
Yonkers Iron worker on Church street turn station, walking on steel and no hard hat	Tully	Require hard hat and no walking on steel	Ray Lekstusis	Closed.
A 35 Euclid, no backup alarm	Tully	Repair backup alarm	Ray Lekstusis	Open.
Oyster Bay Trucking (TV 7661), weak back up alarm on truck	Tully	Repair/replace back up alarm	Ray Lekstusis	Open. spoke with operator, who said it will be fixed tomorrow
Close up gaps in fall protection at top of Plaza platform	Tully	Place barrier wall along these gaps	Ray Lekstusis	Closed.
Facade netting on Bankers Trust building damaged from winds -	Tully - Bankers Trust	Reinstall netting to protect lower workers from falling debris	Ray Lekstusis - Liro	Pending. Subs are working on netting. Not complete.
Worker not wearing eye protection while operating torch.	Tully trim station on Greenwich.	Have worker wear eye protection when operating torch.	Ray Lekstusis	Closed - Worker put eye protection on after talking to Ray Lekstusis
20 foot fall hazard from a leading edge.	Tully north end of Greenwich St by Lieber crane.	Place barricades at the edge.	Ray Lekstusis	Closed
Worker not wearing safety vest while in the middle of the traffic.	Tully pit area.	Have workers wear high visibility vests when in the pit area.	Ray Lekstusis	Closed - Worker put his vest on after discussing it with Ray.
Two Nicholson workers in the pit were not wearing a respirator	Tully pit area.	Have workers wear respirators.	Ray Lekstusis	Closed - Workers put respirators on before leaving the pit area.
Iron workers along plaza steel beams at risk for fall. Inadequate fall protection.	Tully.	Utilize man basket or ariel lift to reach farthest point of steel beam from decking.	Joe Mannino, Sam and the Foreman.	Open - Not observed any work during second shift.
Trip fall hazard from gaps in decking.	Tully. On east slurry wall.	Cover the gaps in the decking.	Vinnie Pirro	Closed. Milling was used to fill voids.

WTC CLEAN FUEL RETROFIT PROJECT

	Background	Benefits	Technical and Operations Issues
PHASE I			
Ultra-Low-Sulfur Diesel Fuel (ULSD)	EPA requires reduction in sulfur emissions from 500 ppm to 15 ppm be met nationwide by 2006.	- ULSD contains 95% less sulfur than conventional diesel. - An immediate emission reduction, soot is reduced by 23%, carbon monoxide emissions by 29%, and total hydrocarbon emissions fall by 67%. - No capital upgrade: no mechanical alterations or vehicle modifications. - No major changes to operations, infrastructure or labor force. - Significantly lower overall costs than alternative fuel solutions. - EPA deadline for sulfur reduction approaches, fuel becomes more widely available to consumers. - Improves and meets community and public clean air goals.	Transition to USLD effects on prices and supply at Ground Zero: none.
PHASE II			
Diesel Oxidation Catalyst System	- Need to reduce diesel exhaust at Ground Zero and abutters. - Carbon monoxide and hydrocarbon reductions are achieved when exhaust gases interact with the catalyst and oxidize to convert to carbon dioxide and water (this process is also call regeneration, which is dependent upon exhaust temperature – above 375 C).	- Substantially reduce PM, HC, CO, and toxic emissions - Substantial reduction or elimination of smoke and odor. - Ease of installation and maintenance. - Oxidation Catalysts cost \$1K to \$3K per unit. - Installation time < 2 hours. - No adverse effects on equipment performance. - Fuel sulfur tolerant.	- Data on engine displacement need for proper sizing of catalysts. - Filter candidates need to be tested for exhaust temperature. - Space constraints can pose problem, as some mufflers are small.
Diesel Particulate Filter System	Systems also controls smoke by removing particulate of carbon from exhaust of diesel engines.	- Substantially remove all visible smoke from the exhaust. - Substantially reduce hydrocarbon emission by as much as 95%. - With the exception of “normal maintenance”, system is completely automatic. - Filter is not detrimental to the operation of vehicle. Operator or mechanic can easily remove used filter and exchanged it with a replacement filter. - Filters can be fitted at a cost of \$4K to \$13K. - Vehicles using particulate filter with ULSD can get about the same emissions results a vehicle powered by natural gas.	Machines/vehicles which idle frequently and those is a state of poor repair are not good candidates.

**EMERGENCY ON-SITE
HOTLINE**

212-747-9193

**PHONE IS MANNED 24/7 AT
FIRE OPERATIONS CENTER
LOCATED AT 10/10 FIRE
STATION
(LIBERTY & GREENWICH)**



Industrial Hygiene Air Sample Results

Summary for Weeks of 11/25 and 12/2

Attached is a summary of the results of the samples collected by ATC associates at the World Trade Center site for the specified weeks.

Sampling for hydrogen sulfide around the area of the south bridge was begun during the week of 12/2. This area has been a source of frequent complaints about "rotten egg" odor. Out of the 8 samples collected in that area, one sample showed a concentration of 16 ppm, which is below the OSHA ceiling PEL of 20 ppm, but above the 8 hour TLV of 10 ppm. This was an area sample taken near a suspected odor source (a storm sewer opening) so it does not represent worker exposure. However, in response to this elevated result, we have included both personal and area samples for hydrogen sulfide in our sampling plan. The results of the other samples collected in the area were either very low or too low to be quantified.

The vast majority of the samples collected by ATC are "personal samples", meaning that the worker wore the sampling device. The vast majority of results have shown exposure levels to be below occupational exposure limits. The exceptions were:

A lead concentration of 2.3 times the PEL on a grappler operator on 10/17

A quartz concentration of 5 times the PEL on a laborer during concrete demolition on 11/16

A quartz concentration of 1.5 times the PEL on concrete mixer operator on 11/19

Following is an explanation of the columns in the attached summary:

Agent Class - This column includes general category of the agents (substances) which were sampled.

of Samples - This indicates how many individual samples were collected for the agent class listed.

of Analytes - This is the number of individual analysis performed. If only one analyze is determined on each sample, then the number of analytes will equal the number of samples. However, most samples are analyzed for more than one agent as follows:

Metals: Aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, selenium, silver, thallium, tin, titanium, vanadium, and zinc. Metal samples are sometimes also analyzed for total particulate.

PAHs: Acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benz(b)fluoranthene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene.

Aromatics: Benzene, ethyl benzene, toluene, and xylene.

Silica: Respirable dust, quartz, and cristobalite.

Aldehydes: Acetaldehyde, acrolein, benzaldehyde, formaldehyde, n-butyraldehyde, propionaldehyde, and valeraldehyde.

Acids: Hydrobromic acid, hydrochloric acid, hydrofluoric acid, nitric acid, phosphoric acid and sulfuric acid



Industrial Hygiene Air Sample Results

Summary for Weeks of 11/25 and 12/2

Highest Analyte - The analyte found in the highest concentration with respect to its occupational exposure limit.

Highest Result - The concentration of the highest analyte.

OSHA PEL - This is the Permissible Exposure Limit (PEL) for the highest analyte. PELs are established by an OSHA rule-making process and are the legal occupational exposure standards.

ACGIH TLV - This is the Threshold Limit Value (TLV) for the highest analyte. TLVs are voluntary guidelines for occupational exposure which are established by the American Conference of Governmental Industrial Hygienists, a private professional organization.

Highest Result / % of OEL - This is the percentage of the occupational exposure limit (OEL) that the highest result represents. This is the value in the "Highest Result" column divided by the lower of either the PEL or TLV and converted to a percentage.

#of NQs - This is the number of analyses that reported that concentration as "not quantifiable" (NQ).

% of NQ - This is the percent of the total analyses which were reported as "not quantifiable".

If you have any questions concerning this information or would like further details about these results, feel free to contact the Liberty Mutual Industrial Hygienist on duty @ 917-566-2576.

Mike Ramsey, CSP, CIH
Senior Industrial Hygienist
Liberty Mutual Insurance Group

12/20/01

Liberty Mutual / ATC Measurement Data

Weekly Summary

Week of:	Agent Class	# of Samples	# of Analyses	Highest Analyte	Highest Result	OSHA PEL	ACGIH TLV	Highest Result % of OEL	Job with Highest Exposure	# of NQs	% NQ	Comments
11/25/01	Total Dust/Metals	17	340	Cadmium	2.8 ug/m3	5 ug/m3	10 ug/m3	56% of PEL	Torch Cutter	188	58%	
11/25/01	Resp. Dust/Silica	13	39	Quartz	0.016 mg/m3	0.1 mg/m3*	0.05 mg/m3	36% of TLV	Spotter	27	69%	
11/25/01	Aromatics	7	28	Toluene	0.0038 ppm	200 ppm	50 ppm	0.0076% of TLV	Torch Cutter	26	93%	
11/25/01	Aldehydes	3	21	Formaldehyde	0.010 ppm	0.75 ppm	0.3 ppm (Ceiling)	1.3% of PEL	Backhoe Operator	15	71%	
11/25/01	PAHs	6	96	Total PAHs	6.8 ug/m3	200 ug/m3	200 ug/m3	3.4% of PEL	Grappler Operator	75	78%	
11/25/01	Asbestos	24	24	Fibers	0.033 f/cc	0.1 f/cc	0.1 f/cc	33% of PEL	Spotter	4	17%	
11/25/01	Acids	6	36	Hydrofluoric Acid	0.01 ppm	3 ppm	3 ppm (Ceiling)	0.33% of TLV	Grappler Operator	59	164%	
11/25/01	Ozone	2	2	N/A				All "Too Low to Quantify"		2	100%	
11/25/01	Carbon Monoxide (TWA)	26	26	Carbon Monoxide	33 ppm	50 ppm	25 ppm	132% of TLV (abbreviated sample - 2 hrs, 9 min)	Flagman	15	58%	1 peak over NIOSH Ceiling of 200 ppm (Grappler Operator)
Totals:		104	612									
12/1/01	Total Dust/Metals	10	202	Arsenic	1 ug/m3	10 ug/m3	10 ug/m3	10% of PEL	Torch Cutter	122	60%	
12/1/01	Resp. Dust/Silica	8	24	Respirable Dust	0.34 mg/m3	5 mg/m3	3 mg/m3	11% of TLV	Equipment Operator	19	79%	
12/1/01	Aromatics	12	48	Benzene	0.0032 ppm	1 ppm	0.5 ppm	0.64% of TLV	Equipment Operator	31	65%	
12/1/01	Aldehydes	6	42	Formaldehyde	0.017 ppm	0.75 ppm	0.3 ppm (Ceiling)	2.3% of PEL	Equipment Operator	29	69%	
12/1/01	PAHs	6	96	Total PAHs	17 ug/m3	200 ug/m3	200 ug/m3	8.5% of PEL	Torch Cutter	52	54%	
12/1/01	Asbestos	26	26	Fibers	0.048	0.1 f/cc	0.1 f/cc	48% of PEL	Spotter	5	19%	
12/1/01	Acids	6	36	Sulfuric Acid	0.059 mg/m3	1 mg/m3	1 mg/m3	5.9% of PEL	Grappler Operator	31	66%	
12/1/01	Ozone	8	8	N/A				All "Too Low to Quantify"		8	100%	
12/1/01	Carbon Monoxide (TWA)	18	18	Carbon Monoxide	5 ppm	50 ppm	25 ppm	20% of TLV	Torch Cutter	14	78%	
12/1/01	Hydrogen Sulfide	8	8	Hydrogen Sulfide	16 ppm	20 ppm (Ceiling)	10 ppm	160% of TLV (Area Sample)	SW Corner, near south bridge	5	63%	
12/1/01	Diesel Fume	11	11	Inorganic Carbon	0.075 mg/m3	3.5 mg/m3	3.5 mg/m3	2.2 % of PEL	Torch Cutter	1	9%	
Totals:		108	508									

Notes:

The PEL for quartz is determined by the formula $PEL = 10 \text{ mg/m}^3 / (\% \text{ quartz} \times 2)$. For dusts with high quartz content this works out to be a quartz concentration of approximately 0.1 mg/m3.

"OEL" = "occupational exposure limit". A generic term encompassing PELs, TLVs and other workplace exposure limits.

"NQ" = "not quantifiable". Substance was not present in sufficient quantity in the sample to report a firm value for the concentration. All quantification levels for the sampling methods used are well below occupational exposure limits.

The area samples for hydrogen sulfide were taken near suspected sources and were not representative of worker exposure.

WTC Daily Safety Report



Report Period: 24 hours beginning 7:30 AM on

December 20th, 2001

Observation/Hazard	Location	Corrective Action Required	CM Person Contacted	CM Response
Drillers working on NW slurry wall in pit without respiratory protection	AMEC	Require respiratory protection in pit.	Paul Difrenna	Open. Issue was mentioned to workers in area as well as Paul Difrenna. He stated that he will address the matter.
AMEX building on 4th floor. Temporary lighting is spliced with plug outlets.	AMEC	Temporary lighting should be improved and wired separately from temporary power.	Paul Difrenna	Open. Will look into improvement.
Fall potential at hole east of WTC 6 location. Leading edge of recently collapsed building	AMEC	Limit personnell access. Area needs to be protected until subsequent demolition is accomplished.	Ray Master	Pending. Will limit access until the remainder of WTC 6 fills the hole.
Cleveland tieback workers on wearing respirators.	Amecc	Have workers wear respirators.	Jeff Melofchick	Closed
Falls from elevation- laborer at 2nd level of AMEX building	AMEC	When working at elevations of 6' or more and outside of guardrail must have PFA system	Duane Matters	Closed- laborer tied off to retractible lifeline provided.
Two DDC engineers in chiller area lacking Eye Protection.	AMEC area near chiller field	Use proper PPE.	Names not given. Refused. Hard hat was marked "Topo"	Open. Refused to comply. Stated they wouldn't leave the site to retrieve glasses. Stated they would wear them in the future.
Iron worker not wearing respirator.	AMEC by wtc 6	Have workers wear respirators.	Jeff Melofchick	Closed
Jersey barriers are not completely around opening and three were not on solid ground.	Amecc by WTC 6 and Vessey	Place Jersey barriers around opening and on solid surface.	Jeff Melofchick	Open - Spoke to Jon who placed saw horses and tape around the open until morning at which time he indicated the barriers would be moved.
Hydro barriers rolled over and not protecting opening.	Amecc by WTC 6 and Vessey	Upright barriers and replace caution tape.	Jeff Melofchick	Closed - Barriers where uprighted and caution tape placed around them.
Mazzocchi Grappler operator was not using his respirator.	Amecc in the pit area	Grappler operators need to wear PPE.	Jeff Melofchick	Closed - Corrected on the spot.
Truck Driver for Grace not wearing hard hat outside of vehicle.	Amecc on Vessey	Operators outside of vehicles in the construction zone should wear PPE.	Jeff Melofchick	Closed - Operator put PPE on his head.
Seven workers in the AMEC area where not wearing PPE.	AMEC Winter Garden	Have workers utilize respiratory protection.	Paul Difrenna	Open. Concrete chippers (Mazzocchi Laborers) working without respirators. Spoke to crew, foreman was not present. Spoke to Paul Difrenna. He stated that he will address the matter
Cleveland Dilling crew in pit not wearing PPE (respirators and safety glasses)	AMEC/ Cleveland	Everyone inside slurry wall is required to wear respirators and safety glasses	Duane Matters	Open. Spoke with John, Cleveland foreman. Said he would have his crew wear this. Checked an hour later and half the crew was still without PPE
Mazzocchi operators refuse to wear respirators (# A26, A11, A21, A27)	AMEC/ Mazzocchi	Grappler operators need to wear PPE.	Duane Matters	Open, spoke with Chris at DDC and he spoke with John, Mazzocchi Supt.
Fall hazard for surveyors at S.West corner of slurry wall	Bovis	Create safe work platform with handrails for surveyors	Ray Master	Open. R. Master stated he is considering a work platform with limited access with handrails
Hot work on one of the main chiller tank on 12/18. Potential acid gas exposure from residual Freon-22.	BOVIS	York agreed (12/19) to submit a written procedure for tank removal discussing the recommended means and methods. DDC, LM and BOVIS will review and establish action plan for worker protection	Brian Peters and Ray Master	Open. Plan being developed. Hot work permit will be issued for other torch work in chiller area. Tanks are not to be cut with torchs.
Jersey barriers of West slurry wall (southern side) lacking walk path for top access. Creating difficult walk/work area	Bovis	Increase distance between slurry wall and Jersey barrier. Some barriers are lacking horizontal life lines.	Bill Ryan	Open. Actual movement of barriers is scheduled by Tully. Tully waiting for generators to be moved.

Report Period: 24 hours beginning 7:30 AM on

December 20th, 2001

Observation/Hazard	Location	Corrective Action Required	CM Person . Contacted	CM Response
Cable ends on tie back systems are unprotected and unmarked. Employees could injure themselves against these.	Bovis	Cover and mark all cable ends on tiebacks until they can be cut off.	R. Master	Pending. Work was ongoing at end of shift.
Some operators and Nicholson workers stated they were not aware of worker orientation	Bovis	Schedule orientation training for workers.	Ray Master	Pending. R. Master stated he is scheduling orientation sessions. Need to get dates from R. Master
1000 ton crane wind meter is not working.	Bovis	Repair wind meter.	Al Parmett	Open
Open trench near slurry wall poses a fall exposure.	Bovis	Place barricades around the trench.	Al Parmett	Closed - Placed a barricade around it and had a worker directing traffic around the trench.
Grace truck #71 operator was not wearing a respirator while the truck was being loaded on the pile.	Bovis	Wear respirators when in the pile area.	Al Parmett	Open - Spoke to Bovis supervisor. He instructed the operator to put it on. After break and a second check the operator was not wearing it after second check. Grace Supervision needs to set the example.
Gateway Demo #3 excavator operator was not wearing his PPE on the pile.	Bovis	Wear respirators when in the pile area.	Al Parmett	Closed - Spoke to supervisor and he corrected operator who wore PPE through shift.
Grace Ind Hitachi excavator operator EX 550 LC and Hitachi grappler ex 1200 was not wearing respirator while on the pile.	Bovis	Wear respirators when in the pile area.	Al Parmett	Closed - Spoke to Bovis supervisor who corrected the worker.
Replace broken Jersey barrier along the south slurry wall. Fence is ready to fall onto workers.	Bovis	Repair or replace barrier	Al Parmett	Open
Operator of truck mounted jack hammer for Grace Industries was not wearing respirators.	Bovis	Wear respirators when in the pile area.	Al Parmett	Closed - Bovis supervisor corrected operator who wore respirator the rest of the shift.
More dust control needed	Bovis	Provide water trucks in dusty and smoky areas	Kathy Moseley	Closed
Lack of PPE usage with potential exposure	Bovis - (Nicholson)	Enforce PPE usage and discipline policy	R. Master	Open
Angel Ariel truck #31 is missing driver side headlight.	Bovis.	Replace headlight.	Ray Master	Open. Recommendation was left with R. Master as he was unavailable.
Eating and drinking in debris area causing potential for illness.	Bovis. Debris Area	Do not eat, drink or smoke in the debris area of the project.	Ray Master	Open. Recommendation was left with R. Master as he was unavailable.
Grace compressed gas cylinders on debris pile creating hazard for explosion or impact injuries.	Bovis. Debris Area	Cap cylinders and removed them from pile. Place into a cage.	Mike Meddin	Closed. Item abated upon request.
Lack of respirator usage by Grace operators (EX 1200, #235 hoe ram), spotters and oiler in pit.	Bovis/ Grace	All employees inside slurry wall area to wear respirators	Kathy Moseley	Closed. Kathy addressed with Grace supt.
Cutting station on West Street. Wind was grabbing the tarp. Potential for collapse. Scaffold was rocking.	Cutting station on West Street. AMEC	Anchors should be improved.	Paul Difrenna	Open. Will improve anchors when scaffold is moved one street over, by end of week.
Fall into an open trench by workers passing by the trench at night and during the day. New Trenching imposes hazard for walkers. Area cannot be cut off except by DDC.	Tully	Cover the trench. Light the area.	Mike Marisco	Closed on second shift.
Fall potential at South slurry wall - chain link fence missing from top of one jersey barrier. Area being used as access point to slurry wall with trades climbing over jersey barrier which increases the potential of a fall.	Tully	Reinstall chain link fencing to prevent access.	Bill Ryan	Open - Foreman will contact superintendent to correct situation. Second shift reviewed with Ed Davis, should be corrected by tomorrow. Not corrected as of today (12/20). Additional missing section on east slurry wall.

WTC Daily Safety Report



Report Period: 24 hours beginning 7:30 AM on

December 20th, 2001

Observation/Hazard	Location	Corrective Action Required	CM Person Contacted	CM Response
Jersey wall on East slurry wall needs to be moved away from edge.	Tully	Increase distance between edge and jersey barrier	Bill Ryan	Open. Second barrier condition was found along east slurry wall. B. Ryan will contact Ingersoll Rand to move generator which is in the way.
Three operators in pit without respirators.	Tully	Have workers wear respirators.	Ray Lekstusis	Closed
Fall from elevation hazard (20') at 130 Liberty Bldg, 2nd floor atrium area	Tully	Perimeter guardrails needed	Ray Lekstusis	Open
Poor housekeeping in the Plaza maintenance area- trip hazards, unsecured gas cylinders	Tully	Improve housekeeping, secure gas cylinders	Bill Ryan	Open, Bill Ryan said this will be abated by noon today
Fall from elevation hazard-SE corner of slurry wall.	Tully	Need to close off corner of ramp with fall protection (barrier wall)	Ray Lekstusis	Open
Yonkers Iron worker on Church street burn station, walking on steel and no hard hat	Tully	Require hard hat and no walking on steel	Ray Lekstusis	Closed.
A 35 Euclid, no backup alarm	Tully	Repair backup alarm	Ray Lekstusis	Open.
Oyster Bay Trucking (TV 7661), weak back up alarm on truck	Tully	Repair/replace back up alarm	Ray Lekstusis	Open. spoke with operator, who said it will be fixed tomorrow
Close up gaps in fall protection at top of Plaza platform	Tully	Place barrier wall along these gaps	Ray Lekstusis	Closed.
Facade netting on Bankers Trust building damaged from winds -	Tully - Bankers Trust	Reinstall netting to protect lower workers from falling debris	Ray Lekstusis - Liro	Pending. Subs are working on netting. Not complete.
Worker not wearing eye protection while operating torch.	Tully trim station on Greenwich.	Have worker wear eye protection when operating torch.	Ray Lekstusis	Closed - Worker put eye protection on after talking to Ray Lekstusis
20 foot fall hazard from a leading edge.	Tully north end of Greenwich St by Lieber crane.	Place barricades at the edge.	Ray Lekstusis	Closed
Worker not wearing safety vest while in the middle of the traffic.	Tully pit area.	Have workers wear high visibility vests when in the pit area.	Ray Lekstusis	Closed - Worker put his vest on after discussing it with Ray.
Two Nicholson workers in the pit were not wearing a respirator	Tully pit area.	Have workers wear respirators.	Ray Lekstusis	Closed - Workers put respirators on before leaving the pit area.
Iron workers along plaza steel beams at risk for fall. Inadequate fall protection.	Tully.	Utilize man basket or ariel lift to reach farthest point of steel beam from decking.	Joe Mannino, Sam and the Foreman.	Open - Not observed any work during second shift.
Trip fall hazard from gaps in decking.	Tully. On east slurry wall.	Cover the gaps in the decking.	Vinnie Pirro	Closed. Milling was used to fill voids.

OSHA SAMPLING RESULTS SUMMARY AS OF 12/20

Asbestos:	A total of 872 air monitoring 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 .1 f/cc. After 9/21, sampling focused on the rubble pile and those workers working on or immediately next to it. 82 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 77 personal samples of workers on the rubble pile showed results ranging from 1 ppm to 34 ppm which are well below the OSHA 50 ppm permissible exposure limit.
Noise:	OSHA has been conducting noise monitoring in the rubble pile. 41 personal samples have been conducted on employees performing (or working near) various operations such as jack hammering, drilling and equipment operations. Employee's exposure to the noise range from 73.7 dBA to 94.5 dBA. OSHA's permissible noise exposure for construction is 90 dBA. One personal sample and one area sample during core drilling operations exceeded the OSHA noise PEL of 90 dBA. OSHA continues to recommend the use of appropriate hearing protection for workers performing tasks where high noise levels are likely to be encountered.
Respirable Silica:	The overwhelming majority of the 402 silica samples show no detectable levels of airborne silica. However, fourteen exposures exceeded the PEL. The highest sample result was approximately nine 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) rubble removal and loading operations near the Winter Garden; 2) during the breaking up of concrete in the pit; 3) while core drilling the concrete slurry wall, and 4) 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.
Volatile Organic Compounds:	OSHA has taken 608 samples for (VOCs) such as acetaldehyde, acrolein, acrylonitrile, benzene, 2-butanone, carbofurans, chlorodiphenyl (PCB), ethyl benzene, formaldehyde, Freon R-22 (chlorodifluoromethane), 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 benzene was found to be at the 8-hr. OSHA Allowable Limit concentration of 1 ppm. This was found on a backhoe operator moving debris. See information below for polynuclear aromatics, Freon R-22, phosgene and dioxin.
Oxides of Nitrogen/ Sulfur:	Sampling on grappeler operators on the rubble pile, and on employees manning truck wash stations revealed trace levels of nitric oxide and nitrogen dioxide. SO ₂ personal and area results were found to be below OSHA limits.

Metals: OSHA has taken 626 air 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, arsenic, and mercury. 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 (9); iron oxide (20); lead (12); and cadmium (2). Accordingly, OSHA is recommending that workers engaged in these operations wear appropriate respiratory protection.

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 samples for dioxin and these samples were analyzed by EPA. One initial sample, representing exposure directly on the pile, showed elevated levels of dioxins when compared to ambient background levels. This value was comparable to the levels found by EPA sampling. The dioxins at this location are being emitted from the on-going rubble fire. Additional sampling was conducted around the perimeter of the pile and revealed levels that were considerably lower than those on the rubble pile. Dioxins are considered collectively as suspect human carcinogens. OSHA does not have a worker standard for dioxins. OSHA is coordinating with EPA, and the Salt Lake City Analytical Laboratory to fully assess the risk posed by the elevated levels of 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 seven samples which reached or exceeded OSHA's coal tar pitch volatile PEL of 0.2mg/m³. These personal samples were taken on the pile on iron workers and grappeler 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 105 samples for Freon R-22 (chlorodifluoromethane). The majority of sample results received to December 17th reveal non-detectable airborne levels. During operations involving Freon removal from the auxiliary chiller that started on 12/5/01, direct reading instrument revealed readings ranging from 100 ppm to one peak near a leaky valve of 500 ppm. SCBA tanks 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.) In response to information about exposure to the decomposition by-products of Freon R-22 used in the air conditioning systems of WTC towers, sampling for hydrofluoric acid (HF) had been conducted. Results for HF revealed non-detectable levels. Sample results for phosgene to date show non-detectable levels.

Crystalline Silica Exposure in the Construction Industry

Occupational Safety and Health Administration U.S. Department of Labor



Health Hazard Information Card

● What is crystalline silica (quartz)?

The terms "crystalline silica" and "quartz" refer to the same thing. Crystalline silica is a natural constituent of the earth's crust and is a basic component of sand and granite.

● What is silicosis?

Silicosis is a disease of the lungs due to breathing of dust containing crystalline silica particles. This dust can cause fibrosis or scar tissue formations in the lungs that reduce the lung's ability to work to extract oxygen from the air. There is no cure for this disease, thus, prevention is the only answer.

● What are the symptoms of silicosis?

There are several stages of silicosis. Early stages may go completely unnoticed. Continued exposure may result in the exposed person noticing a shortness of breath upon exercising, possible fever and occasionally bluish skin at the ear lobes or lips. Silicosis makes a person more susceptible to infectious diseases of the lungs like tuberculosis. Progression of the disease leads to fatigue, extreme shortness of breath, loss of appetite, pain in the chest, and respiratory failure, which all may lead eventually to death. Acute silicosis may develop after short periods of exposure. Chronic silicosis usually occurs after 10 or more years of exposure to lower levels of quartz.

● Where are construction workers exposed to crystalline silica dust?

The most severe exposures to crystalline silica result from sandblasting to remove paint and rust from stone buildings, metal bridges, tanks, and other surfaces. Other activities that may produce crystalline silica dust include jack hammering, rock/well drilling, concrete mixing, concrete drilling, and brick and concrete block cutting and sawing. Tunneling operations; repair or replacement of linings of rotary kilns and cupola furnaces; and setting, laying, and repair of railroad track are potential sources of crystalline silica exposure.

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● How is OSHA addressing exposure to crystalline silica-containing dust?

OSHA has established a Permissible Exposure Limit, or PEL, which is the maximum amount of airborne crystalline silica that an employee may be exposed to during a work- shift. OSHA is also beginning a Special Emphasis Program to inform employers and employees about the occurrence and hazards of crystalline silica and ways to reduce exposure to the dust.

● What can employees do to limit their exposure to crystalline silica?

➤ Employers are required to provide and assure the use of appropriate controls for crystalline silica-containing dust. Be sure to use all available engineering controls such as water sprays and ventilation of containment structures. Substitution of less hazardous materials can also be used.

➤ Be aware of the health effects of crystalline silica and that smoking adds to the damage.

➤ Know the work operations where exposure to crystalline silica may occur.

➤ Participate in any air monitoring or training programs offered by the employer.

➤ Use type CE positive pressure abrasive blasting respirators for sandblasting.

➤ For other operations where respirators may be required, wear a respirator approved for protection against crystalline silica-containing dust. Do not alter the respirator in any way. Workers who use tight-fitting respirators cannot have beards/mustaches which interfere with the respirator seal to the face.

➤ If possible, change into disposable or washable work clothes at the worksite; shower (where available) and change into clean clothing before leaving the worksite.

➤ Do not eat, drink, use tobacco products, or apply cosmetics in areas where there is dust containing crystalline silica.

➤ Wash hands and face before eating, drinking, smoking, or applying cosmetics outside of the exposure area.

If you have any questions about any occupational health matter, feel free to ask us. Our job is to protect your health. For more information, contact your local or Regional OSHA office (listed in the telephone directory under United States Government - Department of Labor - Occupational Safety and Health Administration).

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WTC CLEAN FUEL RETROFIT PROJECT

	Background	Benefits	Technical and Operations Issues
PHASE I			
Ultra-Low-Sulfur Diesel Fuel (ULSD)	EPA requires reduction in sulfur emissions from 500 ppm to 15 ppm be met nationwide by 2006.	- ULSD contains 95% less sulfur than conventional diesel. - An immediate emission reduction, soot is reduced by 23%, carbon monoxide emissions by 29%, and total hydrocarbon emissions fall by 67%. - No capital upgrade: no mechanical alterations or vehicle modifications. - No major changes to operations, infrastructure or labor force. - Significantly lower overall costs than alternative fuel solutions. - EPA deadline for sulfur reduction approaches, fuel becomes more widely available to consumers. - Improves and meets community and public clean air goals.	Transition to USLD effects on prices and supply at Ground Zero: none.
PHASE II			
Diesel Oxidation Catalyst System	- Need to reduce diesel exhaust at Ground Zero and abutters. - Carbon monoxide and hydrocarbon reductions are achieved when exhaust gases interact with the catalyst and oxidize to convert to carbon dioxide and water (this process is also call regeneration, which is dependent upon exhaust temperature – above 375 C).	- Substantially reduce PM, HC, CO, and toxic emissions - Substantial reduction or elimination of smoke and odor. - Ease of installation and maintenance. - Oxidation Catalysts cost \$1K to \$3K per unit. - Installation time < 2 hours. - No adverse effects on equipment performance. - Fuel sulfur tolerant.	- Data on engine displacement need for proper sizing of catalysts. - Filter candidates need to be tested for exhaust temperature. - Space constraints can pose problem, as some mufflers are small.
Diesel Particulate Filter System	Systems also controls smoke by removing particulate of carbon from exhaust of diesel engines.	- Substantially remove all visible smoke from the exhaust. - Substantially reduce hydrocarbon emission by as much as 95%. - With the exception of “normal maintenance”, system is completely automatic. - Filter is not detrimental to the operation of vehicle. Operator or mechanic can easily remove used filter and exchanged it with a replacement filter. - Filters can be fitted at a cost of \$4K to \$13K. - Vehicles using particulate filter with ULSD can get about the same emissions results a vehicle powered by natural gas.	Machines/vehicles which idle frequently and those in a state of poor repair are not good candidates.