



Industrial Hygiene Air Sample Results

Summary for Week of 02-08-02 through 02-15-02

Attached is a summary of the laboratory results completed during the week of February 8, 2002, through February 15, 2002. The air samples were collected by ATC associates at the World Trade Center site.

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

- **A Sulfur Dioxide concentration of 1026% of the shift adjusted OEL.** This was found on an area sample collected next to the Verizon Building at West & Vesey. None of the personal samples approached the OEL.
- **Five quartz concentrations as follows:**
 - 458 % of the shift adjusted OEL.** This was on a bobcat operator in the depression at level B2 at WTC 6.
 - 371 % of the shift adjusted OEL.** This was found on a laborer cleaning debris on level B1 at WTC 6.
 - 150 % of the shift adjusted OEL.** This was found on a jack hammer operator on level B2 at WTC 6.
 - 129 % of the shift adjusted OEL.** This was found on a drilling operation on level B2 at WTC 6.
 - 125 % of the shift adjusted OEL.** This was found on a spotter on level B3 at WTC 6.
- **Two diesel exhaust particulate concentrations as follows:**
 - 206 % of the shift adjusted OEL.** This was found on a torch cutter in the depression southeast of Tower 1.
 - 151 % of the shift adjusted OEL.** This was found on a torch cutter working on the surface next to the Verizon Building.

In addition, the following results are at or above 50% of the shift adjusted OEL (but below 100% of the shift adjusted OEL). The operations associated with these results should receive attention to ensure that these results are an accurate reflection of actual exposures and that feasible steps are taken in an attempt to ensure that exposures do not elevate over time;

- **Four Quartz concentrations as follows:**
 - 92 % of the shift adjusted OEL.** This was found on a bobcat operator on Level B1 at WTC 6.
 - 63 % of the shift adjusted OEL.** This was found on a laborer at a core drilling operation on the north slurry wall on level B2 at WTC 6.
 - 54% of the shift adjusted OEL.** This was found on a bobcat operating in the depression at level B3 at WTC 6.
 - 54% of the shift adjusted OEL.** This was found on a spotter in the depression near Tower 1 where trucks were loading.



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- **Two Diesel Particulate** Concentrations as follows:
66% of the shift adjusted OEL. This was found on a spotter in the depression near Tower 1.
54% of the shift adjusted OEL. This was found on a grappler operator in the depression at WTC 4.
- **An Asbestos concentration at 68 % of the shift adjusted OEL** on a grappler operator in the depression at Tower 1.

Some of the columns in the attached summary may require explanation:

Analyte 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 Analysis - This is the number of individual analyses performed. If only one analysis is performed 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.

Silica: Respirable dust, quartz, and cristobalite.

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

Sulfides: Hydrogen sulfide and sulfur dioxide

OEL - Occupational Exposure Limit is the lower of the OSHA PEL or ACGIH TLV. PELs are established by an OSHA rule-making process and are the legal occupational exposure standards. TLVs are voluntary guidelines for occupational exposure which are established by the American Conference of Governmental Industrial Hygienists, a private professional organization.

Highest % 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.

Shift Adjusted OEL - The OEL reduced to compensate for the reduced recovery time and longer exposure time posed by a 7 day per week , 12 hour shift work schedule.



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Highest % of Shift Adjusted OEL - This is the percentage of shift adjusted OEL that the highest result represents.

#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 at the WTC @ 917-566-2576.

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Sheet1

Start Report Period	End Report Period	Analyte Class	# Samples Collected	Target	% Target	#of Analysis	OEL	Highest % OEL	Shift Adj. OEL	Highest % of Shift Adj. OEL	Analyte	Job Description	#NQ's	% NQ's	# Less than Half OEL	% Less than Half OEL
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Sulfides	13	6	216%	13	2	1026%	2	1026%	Sulfur Dioxide	Area- West & Vesey next to Verizon Bldg	9	69%	12	92%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Silica	24	10	240%	48	0.05	220%	0.4	120%	Quartz	Bobcat operator in depression @ 6WTC Lvl B2	39	81%	43	90%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Diesel Fume	11	8	138%	11	0.02	206%	0.02	206%	Diesel Exhaust Particulates	Torch cutter in depression SE of Tower #1	1	9%	7	84%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Asbestos	6	10	60%	6	0.1	34%	0.05	68%	Asbestos	Grappler operator in depressio Tower #1	0	0%	6	100%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Ozone	5	6	83%	5	0.08	30%	0.08	30%	Ozone	Torch cutter on surface by WTC #4	3	60%	5	100%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Metals	9	9	100%	189	0.05	1%	0.024	2%	Lead	Grappler operator in depression Tower #1	121	64%	180	95%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Acids	7	6	117%	42	1	4%	1	4%	Sulfuric Acid	Torch on surface @ Scaffold next to Verizon Bldg	38	90%	42	100%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Mercury	8	5	160%	8	0.03	1%	0.02	1%	Mercury	Torch in depression @ 2 WTC	8	100%	8	100%
2/8/2002 5:01:00 PM	2/15/2002 5:00:00 PM	Carbon Monoxide	24	15	160%	24	25	8%	18	12%	Carbon Monoxide	Spotter on WTC 6, Lvl B3, cleaned up debris (concrete) after BROKK 160 did work	17	70%	100%	100%