September 15, 2010

Feasibility Advisory Committee
California Department of Industrial Relations
Division of Occupational Safety and Health
1515 Clay Street, Suite 101
Oakland, CA 94612

Attn: Bob Barish

Dear Members of the Feasibility Advisory Committee:

The American Forest & Paper Association (AF&PA), American Wood Council (AWC) and the Inter-Industry Wood Dust Coordinating Committee (IWDCC)[1] including APA -- The Engineered Wood Association, American Home Furnishings Alliance, Composite Panel Association, Hardwood Plywood and Veneer Association, Kitchen Cabinet Manufacturers Association, Wood Machinery Manufacturers of America and Western Wood Products Association are pleased to provide comments on the Permissible Exposure Limit (PEL) for wood dust. Members of AF&PA, AWC and IWDCC have a number of wood manufacturing facilities in California, and therefore have a direct interest in development of a permissible exposure limit (PEL) for wood dust.

The wood and wood products industry has a strong commitment to protecting worker health and safety. To help ensure worker protection, the industry sponsored a 6 year, $1.8 million study by Tulane University on the respiratory health of wood workers, the results of which have been published in the scientific literature.(1) Our members have long supported a 5 mg/m^3 "total dust" PEL, which OSHA promulgated in 1989 as part of its broad Air Contaminants Standard. Although that entire standard was subsequently overturned by an appellate court largely on procedural grounds, members have continued to support this level, which has also been adopted by a number of states including California.

We support HEAC's decision to base its recommended PEL on "total dust" measurement. As reported in the published literature, commercial inhalable dust samplers tend to over sample ultra-large wood particles (>100 µm) which have a low probability of inhalation. We do not believe however that the recommended value of 1 mg/m^3 is generally feasible based on available data.

To assist the Committee with its assessment of feasibility of the PEL, we have examined several large databases on wood dust exposure monitoring. They include Federal

[1] The IWDCC is a consortium of more than 20 North American trade associations with an interest in wood dust health and regulatory issues. The consortium includes wood source suppliers, processing operations, and finished goods manufacturers.

OSHA's Integrated Management Information System (IMIS); published exposure data from the Tulane University study of 10 U.S. wood processing plants [2]; and published wood dust exposures in member states of the European Union [3]. Below, we provide our summary of the data from these three sources.

A. OSHA IMIS

The OSHA IMIS database, initiated in 1979, includes occupational exposure measurements by state and federal inspection personnel at various sites and times. We queried the on-line database for wood dust measurements from 2003 to 2009 the year of latest data entry. We chose this time period to fairly reflect data from the recent past. Over this period, there were a total of 128 "total dust" personal sampling measurements at 53 sites. Four of the sites were non-manufacturing: 2 OSHA sites, 1 DOD site and 1 state waste disposal site. After eliminating data for these non-manufacturing sites, there were a total of 119 measurements. To ensure data to be analyzed had adequate sampling time, we used a cut-off of 240 minutes. This resulted in a total of 92 measurements. Table 1 shows the number and percent of samples below or above the indicated concentration levels, and the geometric and arithmetic means. Of the 92 measurements, 78% exceed the proposed PEL of 1 mg/m^3 total dust, 54% were greater than 2 mg/m^3, 43% greater than 3mg/m^3, 37% greater than 4mg/m^3 and 30% greater than 5 mg/m^3.

Inspection data would be expected to focus on higher exposure jobs, and therefore IMIS data would likely be biased on the high side. However, it should be noted that researchers who had previously analyzed IMIS wood dust exposure data from 1979 to 1997 noted that type of inspection did not influence wood dust exposure levels. [4] The IMIS data include measurements from both programmed (i.e. targeted) and unprogrammed inspections (such as complaints, referrals and follow-up). The researchers found no significant differences between the two types of exposure measurement data.

B. Tulane Study Data

Researchers at Tulane University conducted size-fractionated dust exposure measurements at 10 wood processing plants in the U.S. as part of a longitudinal respiratory health study. There were a total of 2430 valid samples. On June, 23, 2010, Dr. Roy Rando of Tulane, a co-principle investigator of the study, discussed the published exposure and health data with the Health Effects Advisory Committee. He summarized exposure measurement data obtained with the Respicon dust sampler used in the study. (Note: The Respicon sampler is used in research, and provides three dust fractions, the sum of which corresponds to inhalable dust. The Respicon does not sample ultra-large particles, avoiding the problem associated with commercial inhalable dust samplers).

In Table 2, we show summary data for the reported inhalable dust measurements. We have also estimated corresponding "total dust" values using a nominal conversion factor of 2.5 as suggested by ACGIH. [5] The conversion factor is recognized as approximate

since side-by-side inhalable and total dust measurements show variability in the ratio, being dependent on particle size and possibly other factors. With this in mind, 28% of the measurements exceed 1mg/m^3 "total dust".

C. European Union (EU) Database

In a 2006 publication by Kauppinen et al [(3)], the authors present the results of a study designed to estimate occupational exposures in member states of the European Union. Using country and company surveys, National Labor Force statistics, analysis of over 35,000 wood dust measurements from 6 member countries, and expert judgments, the study estimated numbers of workers in various industry sectors exposed to wood dust at different levels of exposure. Wood dust measurement data from the 6 countries were from 1993 to 2002, except in one country data were from 1990-2000 and in another from 1987 – 1998. Exposure measurements compiled had been made using several different sampling methods including those for "total dust" and inhalable dust. The investigators converted all non-inhalable measurements to inhalable dust using approximated conversion factors.

The study estimated that in the years 2000 – 2003, approximately 3.6 million workers employed in 25 EU member states were occupationally exposed to wood dust. Table 3 shows the percent of these workers exposed at various inhalable dust levels. The data are taken from the published paper. To present estimates in terms of "total dust", we have used a conversion factor of 2, the same used by the investigators to convert "total dust" measurements to inhalable dust. Thus, we divided the given inhalable dust ranges in Table 3 by a factor of 2 to give the "total dust" ranges presented in Table 4. As can be seen, 25% of those estimated to be exposed to wood dust are at levels between 1-2.5 mg/m^3 "total dust", and 16% are above 2.5 mg/m^3.

Conclusions

The data we have reviewed from the three large datasets clearly indicate that a 1 mg/m^3 "total dust" PEL is not readily achieved. Further, to consistently comply with a 1mg/m^3 "total dust" PEL, one would need in practice to achieve a lower level based on exposure and sampling variability, typically approximately 0.5 mg/m^3. We urge the Feasibility Advisory Committee to take these data into account in its recommendation of a PEL for wood dust.

If you have any questions, please contact Laurie Holmes at 202-463-5174 or lholmes@awc.org.

Sincerely,

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Robert Glowinski
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References

1. Glindmeyer, HW; et al. Longitudinal respiratory health study of the wood industry. Am. J. Ind. Med. 51: 8:595-609 (2008)

2. Kalliny, MI; et al. A survey of size-fractionated dust levels in the U.S. wood processing industry. J. Occup. Environ. Hyg. 5:501-510 (2008)

3. Kauppinen, T.; et al. Occupational Exposure to Inhalable Wood Dust in the Member Sates of theEuropean Union. Ann. Occup. Hyg., 8:549-561 (2006)

4. Teschke, K.; Exposure to Wood Dust in U.S. Industries and Occupations, 179 to 1997. Am. J. Ind. Med. 35:581-589 (1999)

5. ACGIH Documentation for Wood Dust (2010)

TABLE 1. Tulane Wood Dust Measurements (N= 2363)

Inhalable Dust	Total Dust *	% Greater Than
(mg/m^3)	(mg/m^3)	
0.5	0.2	86
1	0.4	65
2	0.8	37
2.5	1	28
3	1.2	23
4	1.6	16
5	2	10
10	4	2.4

*Inhalable dust/2.5

Table 2. Analysis of OSHA IMIS Wood Dust Data Exposure Measurements 2003 – 2009 (N=92)

	No.	%
< 1 mg/m^3	20	22
>1 mg/m^3	72	78
>2mg/m^3	50	54
>3 mg/m^3	40	43
>4 mg/m^3	34	37
>5 mg/m^3	28	30
>10 mg/m^3	8	8.6

GM = 2.285 mg/m3 AM=4.522

Table 3. Number of Workers exposed to Inhalable Wood Dust, and Distribution (%) of Exposed Workers by Level of Exposure in 25 member states of EU [(3)]

Exposed (thousand)	0.5	0.5-1	1 – 2	2 – 5	>5
3600	mg/m^3	mg/m^3	mg/m^3	mg/m^3	
	21	17	21	25	16

Table 4. Number of Workers Exposed to "Total" Wood Dust*, and Distribution (%) of Exposed Workers by Level of Exposure in 25 Member States of EU

Exposed (thousand)	0.25	.25 – 0.5	0.5 – 1	1 – 2.5	>2.5
3600	21	17	21	25	16

*Inhalable dust/2