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State of California

M e m o r a n d u m

To: Chuck Andrews, Chief
Enforcement Branch

Date: November 2, 1995

Place: Sacramento

Phone: 445-4270

From: Department of Pesticide Regulation - Dennis B. Gibbons, CIH, Senior Industrial Hygienist
Worker Health and Safety Branch
[original signed by Dennis B. Gibbons]

Subject: Compliance Monitoring at Diamond Walnut

On October 19, 1995, staff from Worker Health and Safety conducted full-shift monitoring to determine the concentration of methyl bromide at four work stations at the Diamond Walnut facility in Stockton. At each selected work station, three locations were chosen for the monitoring equipment. For each monitoring location, separate air samples were obtained during the morning and afternoon portions of the work shift. All samples were obtained as area samples and no personal samples were obtained. At all but one work station, the samplers were placed to sample air thought to be representative of the air to which workers were being exposed. Monitoring was also conducted for Diamond Walnut at the same work stations by a consultant, Eric Winegar of the Air Toxics Limited Company. Below I have tabulated the results of our monitoring by work station and compared the results with the DPR target exposure control value of 210 ppb of methyl bromide, time-weight averaged over a 24-hour period (24-hour TWA).

Sorting Line in Cleaning Plant.

In this area, there were 20+ employees continually removing substandard in-shell walnuts from several parallel sorting lines. This area was selected for monitoring because this sorting step appears to be worker's first encounter to recently fumigated nuts coming from the vacuum chambers of the cleaning plant. A steady stream of nuts about one nut deep and about two feet wide is presented to two to three standing or sitting workers at each line. This crew worked a 12-hour shift. This work area occupies approximately one quarter of an enclosed room within the cleaning plant building. On this day, large doors were open at opposite ends of this room. The 24-hour TWA's below indicate the workplace level of methyl bromide on this day in this area was within acceptable levels for a 12-hour workshift. The average 24-hour TWA calculated below indicates these workers were within about 76% of our exposure target value for the 12-hour shift.

Sampling Location	Sampling Time (hours)	Concentration During Sampling Period (ppb)	24-Hour TWA (12-hr work shift) (ppb)
Nut entrance manifold, line # 2	10.3	343	172
Nut exit - sorting line # 2	11.6	324	162
Nut exit - sorting line # 1	11.6	287	144
Average		318	159

Cello Packaging of In-shell Walnuts in Main Building.

In this area, there were 10+ employees packaging in-shell nuts in 400-gram cellophane bags. This area was selected for monitoring because this process involves one of two group work stations within the main building processing recently fumigated nuts coming from the vacuum chambers of the cleaning plant. This group work station is located in the interior of the large main building. This crew worked a 9-hour shift. The levels of methyl bromide on this day in this area were quite uniform. All values were within acceptable levels for the 9-hour work shift. The average 24-hour TWA calculated below indicates these workers were within about 85% of our exposure target value for a 9-hour shift. However, if they were to work for eleven hours at these levels, they would be exposed above our target value. The air concentration for Packing machine # 11 is based only on the afternoon sample. The morning sampler failed.

Sampling Location	**Sampling Time (hours)**	**Concentration During Sampling Period (ppb)**	**24-Hour TWA (9-hr work shift) (ppb)**
Packing machine # 11 - power box	2.9	485	182
Packing machine # 9 - power box	8.5	435	163
Column by boxing person near # 9	8.5	500	188
Average		473	178

Bulk Packaging of In-shell Walnuts in Main Building.

In this area, there were 10+ employees operating machinery that bags in-shell walnuts in 25 Kg bags. This process is the other group work station within the main building processing recently fumigated nuts coming from the vacuum chambers of the cleaning plant. This group work station is also located in the interior of the large main building. This crew worked an 11-hour shift. The workplace levels of methyl bromide on this day in this area were quite uniform and within acceptable levels for an 11-hour workshift. The average 24-hour TWA calculated below indicates these workers were within about 60% of our exposure target value for the 11-hour shift. One sample was lost due to a malfunction in the air sampling pump.

Sampling Location	**Sampling Time (hours)**	**Concentration During Sampling Period (ppb)**	**24-Hour TWA (11-hr work shift) (ppb)**
Column by stitching station	10.7	264	121
Control panel - bag filling	9.6	267	122
On Stitching machine	10.7	void	-
Average		266	122

Truck Dumping Work Station Near Dock 5.

In this area, there was a single employee periodically operating the truck dumping station. This area was selected for monitoring because it is semi-enclosed and within close proximity to the four nearby fumigation chambers. At the present, only two chambers are being used for fumigation, and only one fumigation is scheduled per day. On this day, chamber number 2 was under fumigation. Chamber number 1 was being unloaded. Aeration of chamber number 1 began at 07:00, about one hour after the start of our monitoring. The work station was approximately opposite the back of chamber number 2. This work station was rarely occupied during this test day. The 24-hour TWA's resulting from the two samples representing the work station indicate the workplace levels of methyl bromide on this day were very variable and greatly affected by the movement of air in this area. Two large fans were continually blowing outside air in the direction of this work station. This effect is evident by comparison of the results of the one sampling location on the Foreman's desk (on a shelf above the desk on the phone box) and the sampling location within a couple of feet on the desk surface. These results show this area remains a concern due to unpredictable airborne levels at various distances from the chambers. The sample obtained on the fence between chambers number 2 and 3 indicates a high potential for excess exposure in this area from methyl bromide leaking from chambers 1 or 2 or from fumigant leaking from the introduction area, between these chambers. These values were obtained even with two large fans continually blowing large amounts of fresh air into this area. No average is calculated below due to the wide variability observed.

Sampling Location	Sampling Time (hours)	Concentration During Sampling Period (ppb)	24-Hour TWA (12-hr work shift) (ppb)
Foreman's desk top	10.7	402	201
Foreman's desk, phone box shelf	10.8	31	16
Fence between chambers 2 & 3	10.7	523	262

General Conclusions and Recommendations:

Judged only by the results of this one-shift, one-day monitoring effort compared to the DPR target exposure value, the present permit conditions for methyl bromide fumigation at this site appear to be adequate to control exposure. Although no work station sample exceeded the DPR target value, as considered over a 24-hour period, methyl bromide continues to be ubiquitous and pervasive and approached the level of concern at many sampling sites. For the group work stations, exposure control was being achieved on this day, but not by a reassuring margin (range: 60 to 85 percent of DPR target). At one group work station, exposure would have exceeded the DPR target if the crew had worked a full 12-hour shift. The source of methyl bromide measured in the cleaning plant and the two group work stations is assumed to be due to offgassing from the

walnuts coming from the cleaning plant fumigation. A greater margin of exposure control may be achieved with additional air washes of the vacuum chambers of the cleaning plant or with a greater staging time before these walnuts reach any of the group work stations. We continue to recommend better control over the fumigation (Dock 5 area) and aeration processes (Cleaning plant aeration) as the best method of ensuring, on an overall ongoing basis, workers are not exposed above the DPR target value at any location within this facility.

Specific Recommendations:

Additional controls should be implemented in the Dock 5 area and the Cello packaging area. For Dock 5, no employee should be in this area for any time longer than necessary to dump the trucks. General access to this area should be limited and this work station considered to be within a treatment zone until these chambers are improved. If no further changes are made to the aeration procedure at the cleaning plant, the work shift for the crew in the Cello packaging area should not exceed 9 hours. For the sorting line group work station in the Cleaning Plant, the large doors should remain open during each work shift or additional monitoring should be considered.

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