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TEXAS DIVISION
FREEPORT, TEXAS 77541

PLAINTIFF'S EXHIBIT
DOW-655

ENVIRONMENTAL HEALTH REPORT

AIRBORNE ASBESTOS
CELL MAINTENANCE AREA
CHLORINE 5, BUILDING A-1324

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Summary

Airborne asbestos levels measured within the Chlorine 5, Cell Maintenance area are below the prescribed limits. On most occasions they were below the newly proposed limits and with a little care for detail and better housekeeping these levels could be met.

Even though these levels are low, there is still a potential for over-exposure therefore, your present protective equipment program is still recommended along with improved housekeeping and regular monitoring.

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INTRODUCTION

The Occupational Safety and Health Act (OSHA) requires that occupational exposures to airborne asbestos be controlled so that no worker is exposed to more than 2.0 asbestos fibers per cubic centimeter of air based on the count of fibers greater than 5 micrometers in length. These are determined by a time-weighted average (TWA) exposure for an eight hour workday, and no peak concentrations of asbestos more than 10.0 fibers per cubic centimeter as determined by a minimum sampling time of fifteen minutes.

It has now been proposed to lower the limit to 0.5 fibers per cubic centimeter with a peak exposure of 5.0 fibers.

This survey was conducted at the Chlorine 5, Cell Maintenance area over a period from December 20, 1975 - August 17, 1976.

METHODOLOGY

After discussion with supervision it was decided to see what effect a good cleaning would have on the background levels of airborne asbestos in the Cell Maintenance areas. Pre-wash down samples were taken on December 29, 1975 and December 30, 1975. The building was washed including the ceiling, walls and floor and sampling was repeated on March 16 and 17, 1976.

The Cell Maintenance area was again sampled on August 16 and 17, 1976 to evaluate the overall levels and particularly around the vat area during drawing. The exposure level on the tow motor was also evaluated.

Airborne samples were collected using a Bendix Permissible Air sampling pump (Bendix Corp., Baltimore, Md.). The fibers were collected by pulling air through a Millipore filter (AAWG6 03700) mounted in an open face Millipore disposable cassette. Flow rates for the pumps were calibrated at 1500 cubic centimeters per minute and sample times are shown in Tables I-V.

Samples were analyzed by Lee Martin of Central Laboratories using the following technique:

> Four marked squares are cut from a filter about half-way from the edge to the center. This section is then placed on a drop of clearing solution[1] and placed on a microscope slide. The sample is covered with a cover slip and allowed to clear (about 15 minutes). The sample count is made on a Reichert Zetopan Optical microscope using Normarski interference contrast at 500 magnification. Counts are made for particles greater than 5.0 microns and reported as fibers per filter square.

1 Clearing solution: 0.1 g/ml of clean Millipore filter paper in 1:1 diethyloxalate: dimethylphthalate

RESULTS

Table I shows the levels of airborne asbestos before and after the cleanup with no activity in the Maintenance area.

Table II contains the results of airborne asbestos when activity is goin on in both AM and PM. It is worthy to note that four samples were above the proposed 0.5 TWA but none above the 5.0 peak.

Table III shows results made near the drawing vat. Here again a number of samples were above the TWA but not the peak.

Table IV are levels on dry cathodes, at the drying oven and on a tow motor. When the oven is opened some dry asbestos always seems to escape. Also, the tow motor seems to stir up asbestos as it moves about.

Table V is a result of normal working for a 180 minute period. Again the mixing room (where dry asbestos is handled)is high as well as the area around the drying oven.

DISCUSSION

The washdown of the building did result in lowering the levels of asbestos fibers. They were probably lowered more than these results show since the pre-cleaning time was a damp period (Table I).

When sampling with activity going on (Table II) the levels do increase, but with the exception of area 6 (which is near the mixing vat and drying oven the levels are below the 0.5 fibers. During this test period there was much loose asbestos in the mixing room and lots of dry asbestos on the floor around the vat area. These probably contribute to the high levels in area 7 also.

The mixing vat area at times was very sloppy. During the operation the vat spilled over and the wet asbestos was all over the floor of the vat platform and the area below the platform. Most of this spill was cleaned up in the a.m. but by the p.m. there was still lots of loose and dry asbestos in the area. There was some dry asbestos in the area before the vat operation began. (Table III.)

The results for the drying oven, dryed cathodes and the tow motor were as expected. The drying oven when opened releases for a few minutes, fibers into the atmosphere, but this level seems to decrease shortly after the cathode is removed. The area around the oven seems to be stirred by an air current that flows in that area.

DISCUSSION (continued)

The dry cathodes seem to produce some loose fibers even though they are bonded. For how long these loose fibers are produced is not known, but the area measured on August 16, 1976 (Fig. 1 #15) contained three cathodes from the previous week. These same cathodes were still in place on August 17, 1976(Table IV).

When the tow motor was not in operations it was monitored in the location shown in figure 1. During the work period it was used throughout the Maintenance area. When loose asbestos in on the floor this machine seems to grind and powder it even though it is bonded. This caused the fibrous particles to be spread throughout the Cell Maintenance area.

Even with these levels which are below the TLV limits or peak exposure limits, precautions are taken. The employees wear an approved respirator when working in the mixing room, when opening the drying oven and when working in the vat area. This is done because of the potential for overexposure.

CONCLUSIONS

There is a potential for overexposure while doing some tasks within the Chlorine 5 Cell Maintenance area, but employees are probably not being overexposed because proper protection is used.

It may also be concluded that the cleanup does reduce the normal background levels.

RECOMMENDATIONS

1. It is recommended that a better housekeeping policy be used. When a spill occurs it should be properly cleaned up immediately. Loose asbestos or broken chunks should be picked up and properly disposed of before the forklift runs over them.

2. It is also recommended that the area be totally cleaned on a periodic basis; that is, ceilings, walls, equipment, etc.

3. Broken bags of asbestos should be picked up and sealed immediately. The mixing room should be kept free of loose asbestos when not in operation.

4. It is further recommended that your present program of personnel monitoring be continued and that all personnel in the Maintenance area be included.

EHS
HNE/bbs
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TABLE I

BACKGROUND ASBESTOS LEVELS

CHLORINE 5

LOCATION	DATE	SAMPLE TIME	FIBERS >5.0 MICROMETER/c
		BEFORE CLEANING	
FIG. 1 #2	12-29-75	180 min.	0.10
3	12-29-75	180 min.	0.11
4	12-29-75	180 min.	0.08
5	12-29-75	180 min.	0.46
6	12-29-75	180 min.	0.38
FIG. 1 #2	12-30-75	240 min.	0.23
3	12-30-75	240 min.	0.18
4	12-30-75	240 min.	0.22
5	12-30-75	240 min.	0.52
6	12-30-75	240 min.	0.59
		AFTER CLEANING	
FIG. 1 #2	3-16-76	180 min.	0.006
3	3-16-76	180 min.	0.002
4	3-16-76	180 min.	0.008
5	3-16-76	180 min.	0.007
6	3-16-76	180 min.	0.100
FIG. 1 #2	3-17-76	180 min.	0.008
3	3-17-76	180 min.	0.008
4	3-17-76	180 min.	0.008
5	3-17-76	180 min.	0.009
6	3-17-76	180 min.	0.180

Weather Outside

December 29 --- wet and cold
December 30---- dry and cold
March 16------- warm and dry
March 17------- cool and dry

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TABLE II

ASBESTOS LEVELS

CHLORINE 5

ACTIVITY ON FLOOR A.M.

LOCATION	DATE	SAMPLE TIME	FIBERS >5.0 MICROMETERS/C
FIG. 1 #1	Aug. 16, 1976	30 min.	0.019
2	Aug. 16, 1976	30 min.	0.220
3	Aug. 16, 1976	30 min.	0.310
4	Aug. 16, 1976	30 min.	0.280
5	Aug. 16, 1976	30 min.	0.260
6	Aug. 16, 1976	30 min.	0.760
7	Aug. 16, 1976	30 min.	0.800*
8	Aug. 16, 1976	30 min.	0.230

ACTIVITY ON FLOOR P.M.

FIG. 1 #1	Aug. 16, 1776	30 min.	0.031
2	Aug. 16, 1976	30 min.	0.028
3	Aug. 16, 1976	30 min.	0.202
4	Aug. 16, 1976	30 min.	0.288
5	Aug. 16, 1976	30 min.	0.350
6	Aug. 16, 1976	30 min.	0.820
7	Aug. 16, 1976	30 min.	0.710*
8	Aug. 16, 1976	30 min.	0.200

* No activity inside area

Weather:
August 16, 1976------dry and hot

TABLE III
ASBESTOS LEVELS NEAR VAT
CHLORINE 5

BEFORE FILLING VAT

LOCATION	DATE	SAMPLE TIME	FIBERS > 5.0 MICROMETERS/CC
FIG. 1 #9	Aug. 16, 1976	30 min.	0.620
10	Aug. 16, 1976	30 min.	0.418
11	Aug. 16, 1976	30 min.	0.135
12	Aug. 16, 1976	30 min.	0.096
13	Aug. 16, 1976	30 min.	0.212

DURING FILLING OF VAT

#9	Aug. 16, 1976	30 min.	0.516
10	Aug. 16, 1976	30 min.	0.522
11	Aug. 16, 1976	30 min.	0.280
12	Aug. 16, 1976	30 min.	0.116
13	Aug. 16, 1976	30 min.	0.209

WHILE DRAWING VAT

			#1	#2
#9	Aug. 16, 1976	30 min.	0.313	0.280
10	Aug. 16, 1976	30 min.	0.220	0.218
11	Aug. 16, 1976	30 min.	*	0.088
12	Aug. 16, 1976	30 min.	0.386	0.521
13	Aug. 16, 1976	30 min.	0.089	0.115

AFTER DRAWING VAT (P.M.)

#9	Aug. 16, 1976	30 min.	0.716
10	Aug. 16, 1976	30 min	1.120
11	Aug. 16, 1976	30 min.	0.515
12	Aug. 16, 1976	30 min.	0.318
13	Aug. 16, 1976	30 min.	0.302

* Water sprayed on filter

TABLE IV

ASBESTOS LEVELS
CHLORINE 5

BEFORE ACTIVITY

LOCATION	DATE	SAMPLE TIME	FIBERS >5.0 uM/CC
FIG. 1 #14	Aug. 16, 1976	30 min.	0.802
15	Aug. 16, 1976	30 min.	0.316
16	Aug. 16, 1976	30 min.	0.228 *

DURING ACTIVITY

14	Aug. 16, 1976	30 min.	2.101**
15	Aug. 16, 1976	30 min.	0.392
16	Aug. 16, 1976	30 min.	0.805 ***

* Tow motor not moving
** Dry cathode removed
*** Tow motor working

TABLE V

ASBESTOS LEVELS

CHLORINE 5

NORMAL WORKING

LOCATION	DATE	SAMPLE TIME	FIBERS >5.0 uM/CC
FIG. 1 #1	Aug. 17, 1976	180 min.	0.029
2	Aug. 17, 1976	180 min.	0.016
3	Aug. 17, 1976	180 min.	0.332
4	Aug. 17, 1976	180 min.	0.201
5	Aug. 17, 1976	180 min.	0.350
6	Aug. 17, 1976	180 min.	0.412
7	Aug. 17, 1976	180 min.	0.520
8	Aug. 17, 1976	180 min.	0.181
14	Aug. 17, 1976	180 min.	0.885
15	Aug. 17, 1976	180 min.	0.289

Weather:

August 17, 1976----Hot and dry

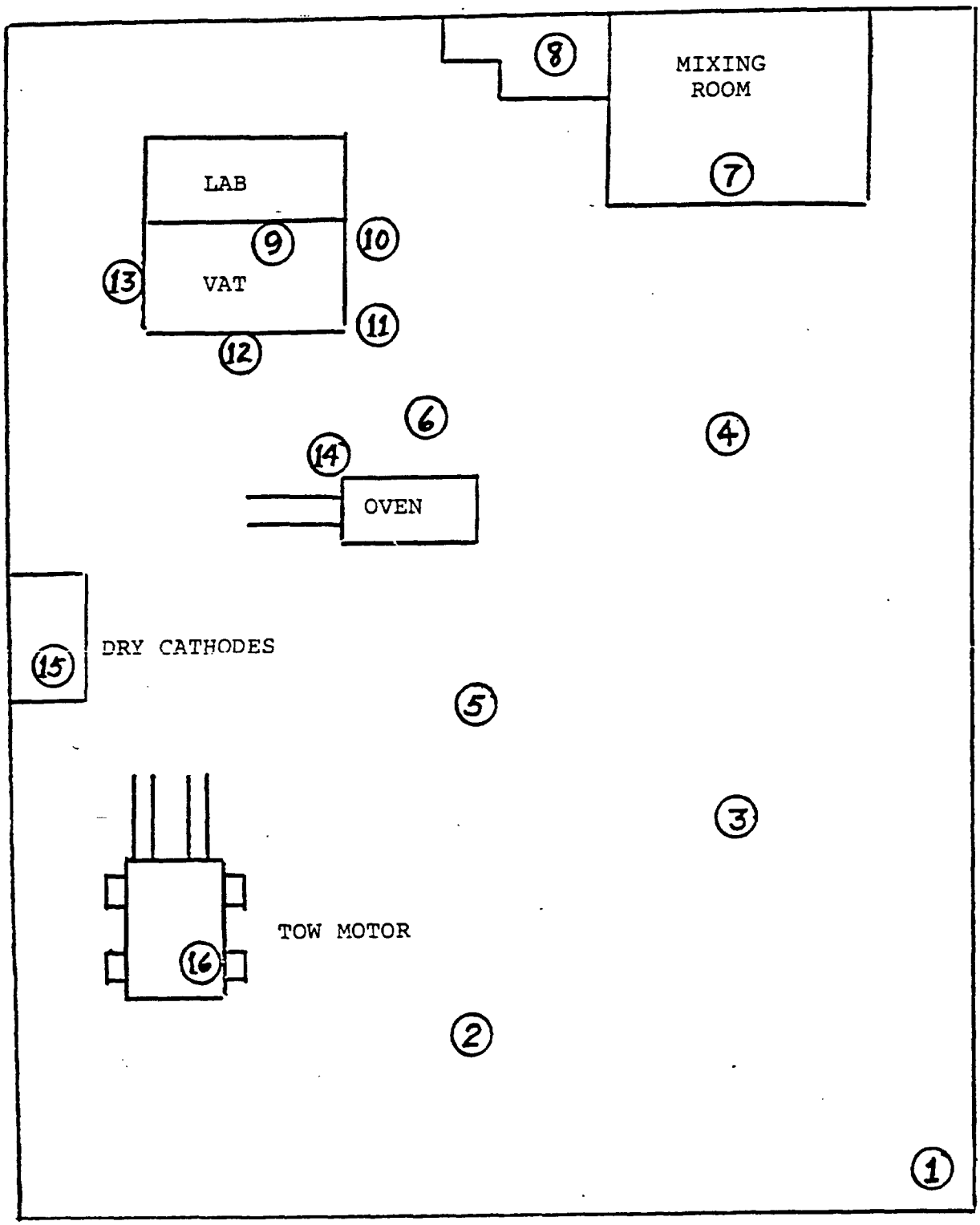

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FIGURE 1

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