

TO	C. L. Woods	FIELD POINT OR DEPT. & BLDG. NO. Calvert City	DATE YOUR LETTER
DM	T. S. Bialke	FIELD POINT OR DEPT. & BLDG. NO. Akron - D/0020, 5-H	DATE THIS LETTER 10-17-79
SUBJECT			

INDUSTRIAL HYGIENE SURVEY - CALVERT CITY

On July 24-27, 1979 an industrial hygiene survey was conducted at Calvert City.

Much improvement in housekeeping in the mercury cell building was apparent. Efforts to reduce Hg exposures have been successful.

Additional ventilation or containment of Hg sources could further reduce Hg exposures.

The Calvert City respirator program has been prepared but needs to be implemented.

Programs for controlling vinyl chloride and benzene were found to be adequate. Physical examinations are also in order.

I wish to thank Gaye Brewer for her assistance and sincerely apologize for the untimeliness of this report.

T. S. Bialke

v

cc: Gaye Brewer (w/attachments)
R.A. Spurlock
M. Fox
G.Krcmar/E.W.Harrington
H. Waltemate
W.C. Becker
P.Whitmire/R.A.Krueger
J.M.Madigan/B.A.DiLiddo
G.F. Lefebvre

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RECOMMENDATIONS:

1. Chlorine Building

- a. Investigate possibility of sealing wooden beams to prevent contamination with Hg.
- b. Provide heated general dilution ventilation to reduce stagnant air pockets in south end of cell building.
- c. Monitor personnel during various tasks to identify high mercury exposure operations.
- d. Initiate Hg hygiene program.

2. General

- a. Provide for periodic review of respirator program implementation.
- b. Maintain a file of safe handling procedures for all substances used in the plant.
- c. Switch to 3M badges for benzene monitoring.

FINDINGS & DISCUSSION:

Much improvement in housekeeping was evident in the Hg cell building. Fewer pools of Hg were noticed in the floor beneath the cells whereas on the previous survey, much Hg was seen on the floor. The new locker room has reduced the likelihood of employees continuously working in a Hg laden micro-environment.

The plant's Hg "sniffer" was used to survey the ambient levels throughout the cell building. Some high level areas (greater than 0.1 mg/M^3) were found, i.e. adjacent to the hot decomposers and near the south wall. The high levels encountered around the decomposers are attributed to Hg being driven out of the cracks in the wooden beams by the heat of the decomposers. In general, it probably can be concluded that the Hg laden wooden beams are the most significant source of airborne Hg. Much Hg can be seen pooling in the cracks and fissures of all the wooden beams. Combining this Hg source with higher than ambient temperatures, especially near the decomposers, results in a continuous subliming of free metallic Hg into the cell room atmosphere. During the survey, the possibility of coating or sealing the beams was discussed. During subsequent meetings and discussions with plant personnel, the plant concluded that this approach is not feasible for a variety of reasons.

I am attaching information on two products from a manufacturer of flooring materials which may have application in sealing the wooden beams. Samples may be obtained from the manufacturers to evaluate these materials. As information on other materials is brought to my attention, I will forward it to appropriate plant personnel.

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4. Hearing Protection (con't)

- c. Continue to obtain noise dosimeter readings in accordance with the BFG Hearing Conservation Program.

Discussion:

Ambient mercury levels were obtained using the plants Hg sniffer. The control room and adjacent office areas were found to have a background level of 0.04-0.05 mg/M³ of mercury. The air entering the rooms through the ventilation system is virtually Hg free. Hg levels increased as the Hg sniffer was moved closer to the floor. Hg levels at the floor sent the Hg sniffer off scale. The Hg is being tracked into the control room and offices from workmen's shoes and is a major contributing source of the background ambient Hg levels. This background can be reduced by periodically removing tracked in Hg. The tracked in Hg is difficult to remove because the floors in these areas are terazzo tile which is very porous. The floors in these areas must be made non-porous and easily cleanable. This can be accomplished by frequent waxing or sealing the floor with a permanent non-porous acrylic sealer. The floors must also be periodically vacuumed and wet washed to removed tracked in Hg.

The concrete floor under the cells also needs to be sealed and made non-porous. Much Hg was observed pooling in the porous concrete, making it extremely difficult to decontaminate. Tests have been conducted to find a durable seamless sealer for this concrete floor. A section of the NE corner is currently being tested and the material appears to be doing an adequate job. If this section holds up over the next few months, consideration should be given to coating the entire floor area with this material.

An EA is being submitted to build a new locker room, break area and to remodel the existing control room and offices. This EA and others involving possible Hg contamination of floors must provide for seamless, non-porous, easily cleanable floor surfaces

The installation of a central vacuum system in the Cl₂ building would greatly facilitate the clean-up of Hg spills.

The Hg sniffer can be a handy tool for demonstrating the presence of Hg on a workman's clothing, hands, or shoes. Using it to show an employee that he "lives" in an Hg cloud due to Hg contaminating his shoes, clothing, hands, etc. and thus impressing upon him the importance of personal hygiene, would contribute to lowering the workers Hg exposure.

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Findings & Discussion (con't)

The lack of air movement in some areas of the cell room may cause the localized concentration of airborne Hg levels. The best method to lower the airborne concentration of a contaminant is to control it at its source by containment or local exhaust ventilation, in this case the source being the Hg in the beams. The next best method is to lower the airborne concentration by dilution ventilation. The plant has proposed to provide additional dilution ventilation to the south wall to improve the air movement and dilute the airborne concentrations of Hg. The proposal should improve the air movement and provide a more comfortable work environment through its cooling effect. At this time the effects this ventilation will have on lowering ambient levels of Hg and reducing worker exposure is unknown.

Monitoring for Hg during the performance of various tasks has not been done. Data from such monitoring should assist the plant in identifying significant sources of task exposure and hopefully will result in new approaches to accomplishing the task, alternative methods, better use of personnel protection devices or engineering modifications.

It is obvious that the personal hygiene habits of workers can have a significant effect on an employee's daily dose of Hg. Such habits as not washing hands before eating or smoking, carrying personal effects into the cell room where they may be contaminated with Hg, taking Hg contaminated work clothing home; not showering before leaving plant, etc. all can result in unnecessary Hg exposure to the employee and/or his family. Proper personal hygiene must be emphasized to cell room employees on a regular basis.

Attached is a copy of the Pedricktown chemical plant's program on working with lead and toxic compounds. Although it was prepared for lead, its basic concept and procedures apply to all toxic compounds. Calvert City should use it as a guide in preparing their Hg hygiene program.

A written respirator program exists, however it needs to be implemented at the respirator users (employee) level. The training of respirator users and proper fitting must be done on a periodic basis. All respirators in the plant must be inspected for cleanliness and serviceability at regular intervals.

The chemical lab has in its files material safety data sheets on most compounds used at Calvert City. The lab however, is not usually contacted by plant personnel for use and handling guidance for these compounds. The Safety Department has more of an occasion and indeed the responsibility to assure the safe handling of equipment and chemicals in the plant. It is for this reason that the Safety Department should maintain a file on all substances used in the plant so that they can adequately oversee the proper work practices and handling procedures necessary to protect the health and safety of Calvert City employees.

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Findings & Discussion (con't)

Benzene in the Carbopol building was monitored. Results are shown in the attached table. Exposures were measured with 3M badges and charcoal tubes. The data shows excellent agreement. This excellent agreement between badge and tube has been demonstrated for benzene by other studies. The Calvert City plant should use the badges exclusively for benzene. Benzene levels found ranged from 0.7 to 4.4 ppm. The plant has a program for benzene leak detection and respiratory protection is required for tasks which result in potential exposure. The program to protect employees by assuring that proper protection is used and leaks are corrected is adequate at this time pending ruling by the Supreme Court on the benzene standard.

T.S.B.

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BENZENE AIR SAMPLING RESULTS
CALVERT CITY - CARBOPOL PRODUCTION

<u>Employee/SS No.</u>	<u>Job</u>	<u>Sample Time (min.)</u>	<u>Sample Method</u>	<u>Benzene (ppm)</u>
M. Mathis 400-78-2396	Polymer 3 Oper.	344	Tube Badge	4.9 4.4
L. Bond 406-82-6576	" 4 "	335	Badge	2.0
J.R. Oakley 404-58-2618	" 1 "	347	Tube Badge	0.9 0.9
F. Coleman 403-86-8846	" 5 "	345	Tube Badge	1.8 1.3
R. Padgett 403-35-0458	Spare Operator	344	Tube Badge	0.7 0.7

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