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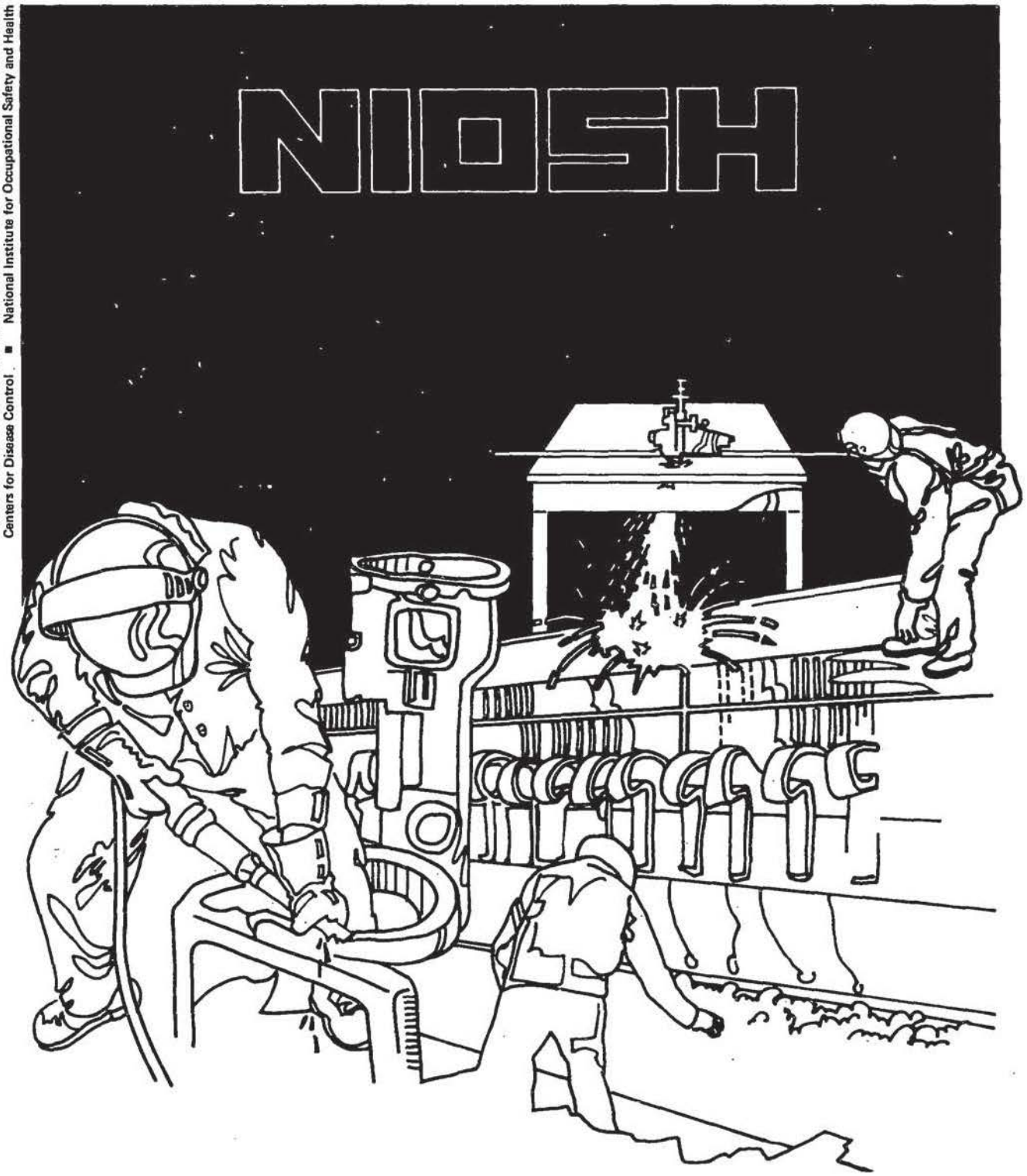

Health Hazard Evaluation Report

HETA 83-134-1327
NATIONAL PARK SERVICE
MOUND CITY GROUP
NATIONAL MONUMENT
CHILLICOTHE, OHIO

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

HETA 83-134-1327
JUNE 1983
NATIONAL PARK SERVICE
MOUND CITY GROUP NATIONAL MONUMENT
CHILLICOTHE, OHIO

NIOSH INVESTIGATORS:
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I. SUMMARY

In February 1983, the National Institute for Occupational Safety and Health (NIOSH) received a request to determine the possible presence of asbestos in the ceiling plaster and in the tap water at Mound City Group National Monument Visitors Service Center, Chillicothe, Ohio. On March 17, 1983, an industrial hygiene survey was conducted by NIOSH. Six area samples and four bulk samples of ceiling plaster were collected for asbestos identification. Tap water was collected for asbestos analysis.

Asbestos area air concentrations ranged from 0.01 to 0.02 fibers/cubic centimeter (f/cc) 8-hour time-weighted average (TWA). The NIOSH recommended criteria for asbestos is 0.1 fibers/cc TWA. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit is 2.0 fibers/cc 8-hour TWA. The measured air concentrations were all below the criteria used by NIOSH and OSHA. Three of four bulk ceiling material samples contained chrysotile asbestos ranging from 2% to 60%. No asbestos fibers were detected in the tap water filtrate as determined with transmission electron microscopy analysis.

Based on the environmental sample results and available toxicological information, NIOSH concludes that a health hazard did not exist at the time of this survey on March 17, 1983. Recommendations to aid in providing a safe and healthful working environment are presented in Section VII of this report.

KEYWORDS: SIC 799 (National Park Service), asbestos, plaster, tap water.

II. INTRODUCTION

In February 1983, NIOSH received a request for technical assistance from the superintendent of the National Park Service, Chillicothe, Ohio, to determine the possible presence of asbestos in the ceiling plaster and the tap water at the visitor center located in the Mound City Group National Monument. An industrial hygiene survey was conducted on March 17, 1983.

III. BACKGROUND

Mound City Group Monument in Chillicothe, Ohio, is a modern National Park Service Visitor Center which provides information and interpretation for those who visit the largest group of burial mounds in existence built by the Prehistoric Hopewell People between 300 B.C. and A.D. 600.

IV. EVALUATION DESIGN AND METHODS

Six area samples for airborne asbestos were collected in the museum for 8 hours, on cellulose ester membrane filters, mounted in open-faced cassettes using a battery-powered vacuum pump at a flow rate at 1.5 liters per minute (lpm). The samples were analyzed using phase contrast microscopy according to NIOSH Method P&CAM 239.[1]

A visual estimation of the percentage of asbestos in the four bulk samples that were collected in the museum was made utilizing polarized light microscopy and dispersion staining techniques.

Approximately 10 gallons of tap water from Mound City Group Monument Visitors Center in Chillicothe, Ohio, was collected and analyzed for asbestos using optical and transmission microscopy.

V. EVALUATION CRITERIA

As a guide to the evaluation of the hazards posed by workplace exposures, NIOSH field staff employ environmental evaluation criteria for assessment of a number of chemical and physical agents. These criteria are intended to suggest levels of exposure to which most workers may be exposed up to 10 hours per day, 40 hours per week for a working lifetime without experiencing adverse health effects. It is, however, important to note that not all workers will be protected from adverse health effects if their exposures are maintained below these levels. A small percentage may experience adverse health effects because of individual susceptibility, a pre-existing medical condition, and/or a hypersensitivity (allergy).

In addition, some hazardous substances may act in combination with other workplace exposures, the general environment, or with medications or personal habits of the worker to produce health effects even if the

occupational exposures are controlled at the level set by the evaluation criterion. These combined effects are often not considered in the evaluation criteria. Also, some substances are absorbed by direct contact with the skin and mucous membranes, and thus potentially increase the overall exposure. Finally, evaluation criteria may change over the years as new information on the toxic effects of an agent become available.

The primary sources of environmental evaluation criteria for the workplace are: 1) NIOSH Criteria Documents and recommendations, 2) the American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values (TLV's), and 3) the U.S. Department of Labor (OSHA) occupational health standards. Often, the NIOSH recommendations and ACGIH TLV's are lower than the corresponding OSHA standards. Both NIOSH recommendations and ACGIH TLV's usually are based on more recent information than are the OSHA standards. The OSHA standards also may be required to take into account the feasibility of controlling exposures in various industries where the agents are used; the NIOSH-recommended standards, by contrast, are based solely on concerns relating to the prevention of occupational disease. In evaluating the exposure levels and the recommendations for reducing these levels found in this report, it should be noted that industry is legally required to meet only those levels specified by an OSHA standard.

A time-weighted average (TWA) exposure refers to the average airborne concentration of a substance during a normal 8- to 10-hour workday. Some substances have recommended short-term exposure limits or ceiling values which are intended to supplement the TWA where there are recognized toxic effects from high short-term exposures.

VI. RESULTS AND CONCLUSIONS

Three of the four bulk samples contained chrysotile asbestos ranging from 2% to 60%. The results are presented in Table I.

Results of environmental air samples collected for asbestos are presented in Table II. Asbestos concentrations (for 6 samples) ranged from 0.01 to 0.02 fibers/cc 8-hour TWA.

The NIOSH criteria is 0.1 fibers/cc 8-hour TWA. Since asbestos is a carcinogen, NIOSH policy is to reduce to the lowest feasible limit; the 0.1 f/cc is the lowest reliable detectable limit of analytical method generally available. The OSHA standard is 2.0 fibers/cc 8-hour TWA. The measured air concentrations were all below the criteria used by NIOSH and OSHA. Although the ceiling plaster contained chrysotile asbestos, the air sampling results demonstrate that the asbestos fibers are not being released.

The tap water from Mound City Monument in Chillicothe, Ohio, contained some filament-like particles of probable organic origin, but no mineral fibers of any type.

Based on the environmental sampling results and available toxicological information, and the fact that the ceiling throughout the building is generally in good condition, NIOSH concludes that a health hazard did not exist at the time of this study.

VII. RECOMMENDATIONS

1. Continue to have your maintenance staff routinely monitor the condition of the ceiling plaster for pealing or other conditions that might indicate a possible release of asbestos.

2. Since the plaster containing asbestos is not damaged, another coat of paint will further aid in preventing the asbestos from becoming airborne.

3. If a decision is made in the future to remove the plaster containing asbestos, a contractor familiar with the removal of asbestos products should be used in this case to prevent potential asbestos exposure problems.

VIII. REFERENCES

1. National Institute for Occupational Safety and Health. NIOSH manual of analytical methods. Vol 1, 2nd ed. Cincinnati, Ohio: National Institute for Occupational Safety and Health, 1977. (DHEW (NIOSH) publication no. 77-157-A).

IX. AUTHORSHIP AND ACKNOWLEDGEMENTS

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X. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), 5285 Port Royal, Springfield, Virginia 22161. Information regarding its availability through NTIS can be obtained from NIOSH

Publications Office at the Cincinnati address. Copies of this report have been sent to:

1. Superintendent Mound City Group National Monument
2. NIOSH, Region V
3. OSHA, Region V

For the purpose of informing affected employees, copies of this report shall be posted by the employer in a prominent place accessible to the employees for a period of 30 calendar days.

TABLE I

Results of Bulk Samples Collected for Asbestos

United States Department of the Interior, National Park Service
Mound City Group National Monument
Chillicothe, Ohio
HETA 83-134

March 17, 1983

Location	Asbestos %	Type
Museum Lobby (Ceiling Sample)	2-5%	Chrysotile
South Museum (Ceiling Sample)	50-60%	Chrysotile
Main Office (Ceiling Sample)	40-50%	Chrysotile
Storage Area	No Asbestos Detected	

TABLE II

Results of Area Samples for Asbestos

United States Department of the Interior, National Park Service
Mound City Group National Monument
Chillicothe, Ohio
HETA 83-134

March 17, 1983

Location	Sample Period	Sample Volume Liters	Asbestos Concentration (Fibers/cc)
Superintendent Office	0730-1531	721	0.01
Main Office	0733-1533	720	0.01
Museum Lobby	0736-1536	720	0.02
Visitor Entrance	0738-1538	720	0.01
South Museum	0739-1540	721	0.01
North Museum	0742-1543	721	0.01

Present OSHA Standard	Recommended NIOSH Standard
2.0 f/cc - 8-hour TWA	0.1 f/cc - 8-hour TWA
10.0 f/cc - 15-minute ceiling	0.5 f/cc - 15-minute ceiling

Concentrations of asbestos are given in fibers greater than 5 u in length per cubic centimeter of air (f/cc).

Limit of detection used by the laboratory was 0.01 f/cc.

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