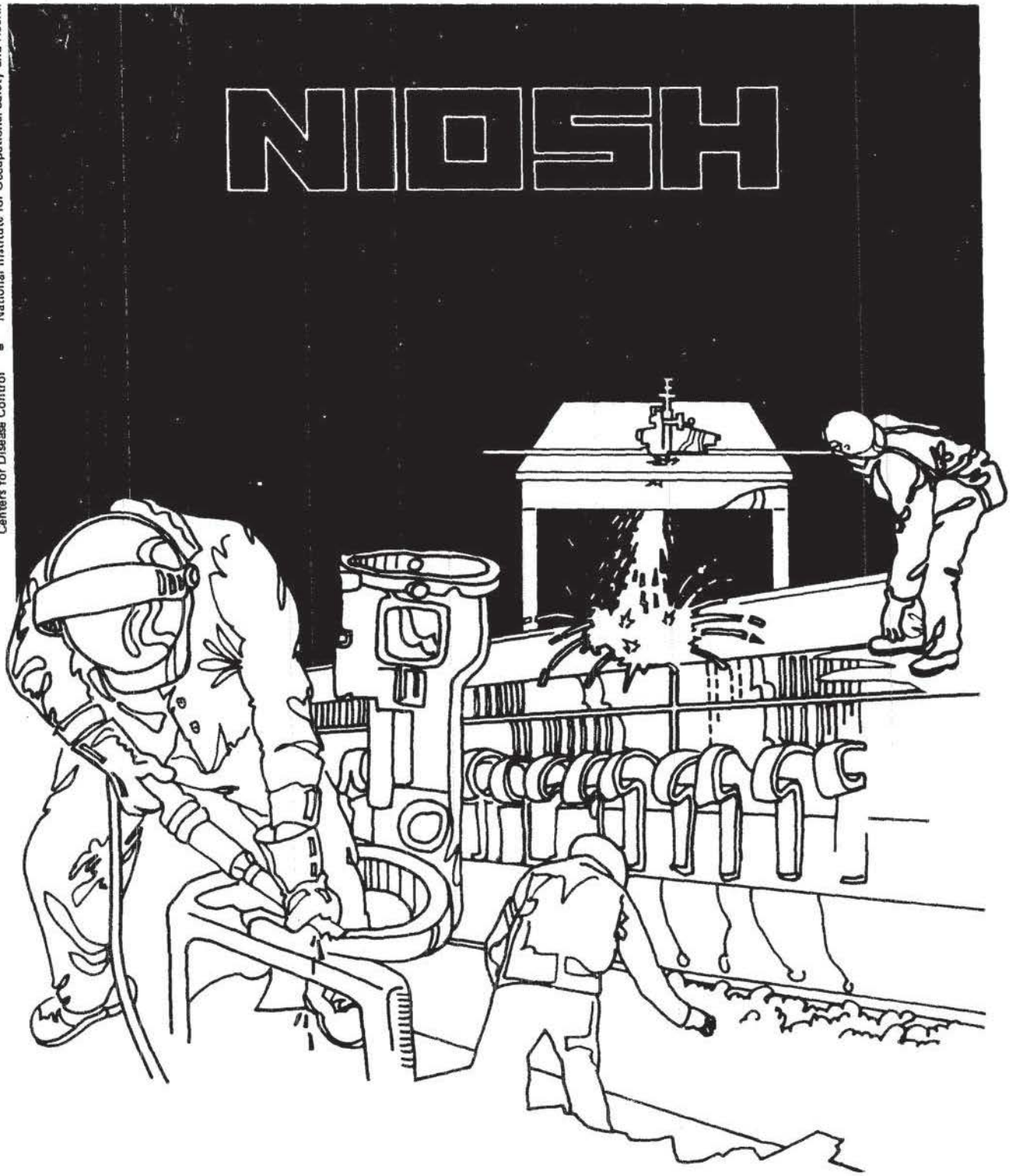
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES ■ Public Health Service
Centers for Disease Control ■ National Institute for Occupational Safety and Health

NIOSH



Health Hazard Evaluation Report

HETA 83-176-1310
EASTON ELEMENTARY SCHOOL
MORGANTOWN, WEST VIRGINIA

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.

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MAY 1983
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NIOSH INVESTIGATOR:
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I. SUMMARY

In February 1983, the Division of Respiratory Disease Studies, National Institute for Occupational Safety and Health (NIOSH) received a request from the Superintendent of Schools, Monongalia County Schools, Morgantown, West Virginia to conduct a survey at Easton Elementary School to determine if a hazard existed due to airborne asbestos fibers.

Asbestos was found in bulk samples of pipe insulation being removed by maintenance personnel and in settled dust samples obtained within six feet of the worksite. Personal breathing zone and area filter samples did not indicate the presence of a significant amount of aiborne asbestos fibers.

Based on the results of the environmental evaluation, NIOSH has determined that an asbestos health hazard did not exist at the time of evaluation.

KEYWORDS: SIC 8211 school, asbestos

II. BACKGROUND

The Easton Elementary School was constructed in the 1920's. There have been renovations in the past few years. However, the old portion of the facility still contains asbestos-wrapped steam pipes. On February 24, 1983, it was brought to the attention of the school administration that school children were possibly being exposed to asbestos while playing with damaged pipe insulation.

The superintendent of schools decided to close the school on February 25, 1983 to remove the damaged asbestos insulation and replace it with a non-asbestos material (fiberglass). It was also on this date that NIOSH was requested to conduct environmental monitoring to determine whether asbestos fibers had been dispersed throughout the facility thereby creating a hazardous condition for the students and staff.

III. HEALTH EVALUATION CRITERIA

Inhalation of asbestos has been shown to result in serious and irreversible diseases. These include lung cancer, mesothelioma (a rare malignancy of the linings of the chest and abdominal cavities), cancer of the stomach, colon, and rectum, and asbestosis (a non-malignant scarring of the lungs).(1)
There is typically a period of many years (15 plus) between initial exposure and the appearance of asbestos related diseases.(2) Data indicate that the lower the exposure, the lower the risk of developing cancer. However, excessive cancer risks have been demonstrated at all fiber concentrations studied. Evaluation of available human data provides no evidence for a threshold or for a "safe" level of asbestos exposure.(3)

It is NIOSH's contention that the standard should be set at the lowest level detectable by available analytical techniques. Since phase contrast microscopy is the generally available and practical analytical technique at the present time, this level is defined as 0.1 asbestos fibers/cc 5 m in length on an 8-hour time weighted average basis with peak concentrations not exceeding 0.5 asbestos fibers/cc 5 m in length based on a 15 minute sampling period. A fiber is defined as a particle with longest dimension (length) at least three times as long as its shortest dimension (diameter). It must be pointed out that this standard was not designed for the population-at-large. The standard was designed for the manufacturing, processing, and use of asbestos and asbestos containing products as applicable under the Occupational Safety and Health Act of 1970.(3)

IV. METHODS AND MATERIALS

Environmental samples were obtained on February 25, 1983 while the maintenance workers were removing the damaged pipe insulation and replacing it with a fiberglass material and again on February 26, 1983 after the maintenance crew had completed the repairs and after the facility was cleaned.

Sampling and analysis consisted of (1) collecting bulk samples of the old pipe insulation and settled dust samples in the immediate vicinity of the work and analysis by polarized light microscopy to determine the presence of asbestos, and (2) area and personal breathing zone filter samples obtained in the areas in which the work was performed and on the two maintenance workers and on the custodian who conducted the final cleaning of the areas. These samples were analyzed using phase contrast microscopy in which all fibers (asbestos, cellulose, fiberglass, etc.) with an aspect ratio of 3:1 and greater than 5 m in length were counted.

V. RESULTS, DISCUSSION AND RECOMMENDATIONS

Analysis of the bulk and settled dust samples collected on February 25 confirmed the presence of chrysotile asbestos.

Analysis of the filter samples obtained revealed that a majority of the samples collected on February 25 while the workers were removing the damaged pipe insulation, and all of the filter samples collected on February 26 contained less than 0.1 fiber/cc. This fiber count included all fibers (asbestos, fiberglass, cellulose, etc.) with an aspect ratio of 3:1 and greater than 5 m in length. Two personal samples obtained on the maintenance workers and one area sample obtained during the repair process on February 25 contained concentrations of 0.18, 0.50, and 0.18 fibers/cc respectively. The majority of these fibers counted were fiberglass, not asbestos. The workers handled the fiberglass material less carefully than the asbestos containing pipe insulation.

The school administration was immediately informed of the above results and NIOSH's conclusion that there did not appear to be a hazard to the children and staff due to airborne asbestos. Therefore, the school was reopened on Monday, February 28th.

The NIOSH surveyor was informed that all the public school facilities in Monongalia County had been surveyed according to the 1979 U.S. Environmental Protection Agency's guidelines for determining asbestos in schools. However, it is recommended that due to the situation which occurred at Easton Elementary School after the initial survey, the remaining facilities again be surveyed paying particular attention to areas where children may have access to and may have

damaged sealed materials resulting in exposure to the children handling the material.

Damaged asbestos containing insulation needs corrective action. If the amount of damage is small, the material should be wrapped and sealed to prevent fiber release. In some instances the material may be damaged to the point that replacement is required. In either situation, the potential for exposure cannot be ruled out for personnel required to work with and in close proximity to the asbestos. Appendices 1 and 2 provide guidelines for individuals repairing and or replacing asbestos materials.

VI. REFERENCES

1. Michaels, L., Chrssick, S., Asbestos, Properties, Applications, and Hazards. Vol 1, John Wiley & Sons, 1979.

2. Workplace Exposure to Asbestos. DHHS (NIOSH) Publication No. 81-103, 1980.

3. NIOSH, Revised Recommended Asbestos Standard. DHEW (NIOSH) Publication No. 77-169, 1976.

4. Asbestos Containing Materials in School Buildings: A Guidance Document. Parts 1 and 2. United States Environmental Protection Agency. Publication No. EPA-450/2-78-014.

VII. AUTHORSHIP AND ACKNOWLEDGEMENTS

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VIII. 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 of Schools, Monongalia County Schools
2. NIOSH Regional Office III

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.

APPENDIX 1

ASBESTOS STRIPPING PROCEDURES
(Adapted From References 1 and 4)

1. Notify EPA of intention to remove, demolish or renovate asbestos at least 20 days prior to commencement (40 CFR 61-11(d).

2. Survey the job and draw up an operational plan considering:

   a) The means for sealing off the work area.

   b) Method of transporting asbestos waste from the work area, through the barriers to transportation.

   c) Identify locations and provisions for change of rooms, toilet, and showering facilities.

   d) Choice of protective equipment. (29 CFR 1910.134)

   e) Contamination control procedures.

   f) Identification of sanitary land fill.

   g) Ventilation openings, drains, etc., to be sealed or filtered.

   h) Water and electrical services.

   i) Monitoring facilities and frequency of sampling.

   j) Identification of the equipment to be covered/removed.

   k) Provisions for maintenance.

   1) Security system.

3. Air sampling to determine background fiber levels.

4. Begin operation by removing designated equipment. Cover remaining equipment and hard to clean surfaces with PVC or polyethelene sheet. Seal openings, such as windows, doors, ventilation systems, etc.

5. Seal off the area with PVC or polyethelene sheet. Overlap joints and heat seal or tape. If the area to be stripped is large, it should be compartmentalized. Access into the work zone must be through an air lock system which may be incorporated into the changing and washing facilities. The work area should be kept below atmospheric pressure with an exhaust fan equipped with an absolute filter. Floors should also be covered.

6. The barrier, air lock system should be constructed so that the worker passes from the work zone into successively cleaner areas, e.g., work zone to vacuum area to asbestos clothing change room to shower room to personal clothing change room to external unrestricted area.

APPENDIX 2

GUIDELINES FOR REDUCING ASBESTOS EXPOSURE
(Adapted From References 1 and 4)

1. The ventilation system should be turned off and remain off until the work is completed and the area has been cleaned.

2. Whenever asbestos containing material must be handled, an approved respirator should be worn. (29 CFR 1910.134)

3. Make sure that only those persons who are necessary for the job are in the area.

4. Place a plastic drop cloth below the work area.

5. Spray the asbestos containing material with water before it is disturbed.

6. Put all the asbestos removed into a heavy plastic bag, label it and send to the landfill.

7. After the job is completed, clean all the ladders and tools used with a wet cloth.

8. Roll up the dropcloth carefully and put it in a plastic bag. Discard the bag.

9. Clean the floor below the work area with a wet mop.

10. Put the mop head and the cloth used to clean the ladders in a plastic bag while they are still wet, seal the bag, and discard it.