PLAINTIFF'S EXHIBIT

SWB-146

Bell Laboratories

600 Mountain Avenue
Murray Hill, New Jersey 07974
Phone (201) 582-3000

April 10, 1979

James McClatchey
Western Electric
222 Broadway
New York, New York

Dear Mr. McClatchey:

This note is in reference to the information you requested on asbestos in insulating material in general, and Bell Labs West Long Branch location in particular. I have enclosed the items you requested and some other material which I hope you will find useful.

1. The reports of the air sampling done at Bell Labs West Long Branch location as analyzed by phase contrast microscopy and transmission electron microscopy.
2. A copy of the report by Gene Grieger on the transmission electron microscopy analysis of the above sampling.
3. A copy of the cover page and table of contents from an EPA Guidance Document on "Sprayed Asbestos Containing Materials in Buildings."
4. A copy of the cover page and table of contents from a report to the National Institute of Environmental Health Sciences on "Control of Sprayed Asbestos Surfaces in School Buildings."
5. Notes taken from the presentation of the Asbestos Task Force at the New York City Board of Education describing the steps they are taking to control asbestos in insulating materials.

If you would like any further information, please let me know.

Sincerely,

CPLichtenwalner

Charles P. Lichtenwalner

Copy to (see next page)

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			Phase Contrast		TEM	
Sample #	Location	Volume Sampled	Fibers Counted	Concentration (f/cc)	Fibers Counted	Concentration (f/cc)
011078A-050	3rd Floor Fan Room	670 l.	13	0.03	0	ND (<.010)*
-052	2nd Floor Middle of Room	660 l.	56	0.13	1	.010
-054	1st Floor Middle of Room	640 l.	37	0.09	0	ND (<.010)*

* Detection limit assumes 1 fiber was detected

Blank			3	—	Not Analyzed by TEM
011078A-051	3rd Floor Middle of Room	450 L.	1	ND (<.01)	
-053	2nd Floor Middle of Room	650 L.	16	.04	
-055	1st Floor " " "	620 L.	44	.11	

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walter c. mccrone associates, inc.
CONSULTING ULTRAMICROANALYSIS • MICROSCOPY • SMALL PARTICLE PROBLEMS • SOLID-STATE CHEMISTRY

27 February 1978

Mr. C. P. Lichtenwalner
Bell Laboratories
600 Mountain Avenue
Murray Hill, New Jersey 07974

Dear Mr. Lichtenwalner:

Using transmission electron microscopy combined with selected area electron diffraction for identification of particulate species, we have analyzed three samples of filter membranes identified as 011078A-050, -052 and -054. In Samples 050 and 054 no evidence of asbestos fibers were detected, while in 052 only one fiber of chrysotile asbestos was found. In view of the ubiquity of chrysotile asbestos, it is unrealistic to talk of a zero background level: we, therefore believe that the presence of this one chrysotile fiber does not represent a significant presence of asbestos.

We have already had some discussion by telephone on the calculation of detection limits and what they mean in this type of analysis. Let me summarize briefly the procedure involved. The air or water being sampled is drawn through a membrane filter. The entire exposed area of that filter, therefore, should contain an accurate sampling of the particulate material present in the sampled fluid. In the electron microscope, of course, we only examine a very small proportion of this sample. From the ratio of the area of the filter to the area which we examine, we determine the number of fibers present on the filter and if the volume of sample filter is known, we can then determine the number of fibers per unit volume. In the case of these samples, calculation gives us a limit of detection of approximately 6680 fibers/filter. You had indicated that we should assume a filtered volume of one liter, this would therefore be 6680 fibers/liter. This may sound rather a poor sensitivity, however, I suspect that you did not actually sample one liter since this would be equivalent to a 30 second sampling at the recommended flow rate for personal samplers (2 liters/min.). More typically, suggested sampling times are on the order of 150 minutes at 2 liters/min. for such samples and, if this is what was used, then of course the sensitivity improves dramatically to about 20 fibers/liter.

You were also interested in the mass sensitivity of the method. If we assume that the limit of detection in our electron microscope, using selected area electron diffraction to positively confirm the identity of a chrysotile asbestos fiber, is one fiber of approximately 250-300 Å in diameter and approximately

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2000 Å long, then the mass of such a fiber is of the order of 10^{-15} grams and hence the mass sensitivity is of the order of 10^{-11} grams/liter, assuming that only one liter was filtered. Again, a more realistic figure would be something approaching 300 liters sampled which would give two orders of magnitude improvement on the mass sensitivity per liter, or about 10^{-13} grams/liter. Comparing this now with published data, the earlier method used by the EPA, which was developed by Batelle, was specifically a mass method which has a minimum sensitivity of one nanogram/cubic meter, that is, 10^{-12} grams/liter. A more recent provisional methodology manual published by EPA on electron microscope measurement of airborne asbestos concentration again indicated sensitivities of the order of 10^{-9} grams/mm^3. I would point out that in this latter document the area examined on the electron microscope grid which is recommended by the authors, is approximately 1/4 to 1/5 of the area which we actually used and therefore we would expect a factor of four or five difference in our sensitivities with our method yielding the higher sensitivity.

Finally, it is unrealistic to consider asbestos levels without considering possible background contamination effects. We have run many samples in which we detect no asbestos fibers whatsoever. However, chrysotile asbestos is now such a ubiquitous material that it is unrealistic to talk of a zero background. Comparative data for backgrounds obtained by different people is perhaps misleading. However, at one time the Mt. Sinai School of Medicine, one of the prime movers in asbestos analysis in this country, was at one time reporting background fiber counts of six fibers per electron microscope grid square. As we sampled 15 grid squares in this particular instance, you can see that the one fiber that we detected in Sample 052 would represent 1/90th of their normal background. Another laboratory has quoted figures as high as 12-30 fibers per electron microscope grid square; a figure which, to us, represents a serious contamination problem, while the EPA provisional water methodology regards the presence of five fibers on an area of 5-7 grid squares as being "not statistically significant". I therefore believe that, for all intents and purposes, you can regard all three samples as being essentially free of asbestos contamination.

I trust the above description has helped you understand better the calculations and some of the problems involved in presenting asbestos data of this type.

We thank you for consulting McCrone Associates and if you have any further questions concerning this report, please feel free to contact us.

Yours sincerely,

I. M. Stewart

Ian M. Stewart
Manager, Electron Optics Group

Gene R. Grieger

Gene R. Grieger
Senior Research Physicist

IMS:GRG/fe
ref: 6503 - P.O. 106694

Chrysotile #52

(50,000X)

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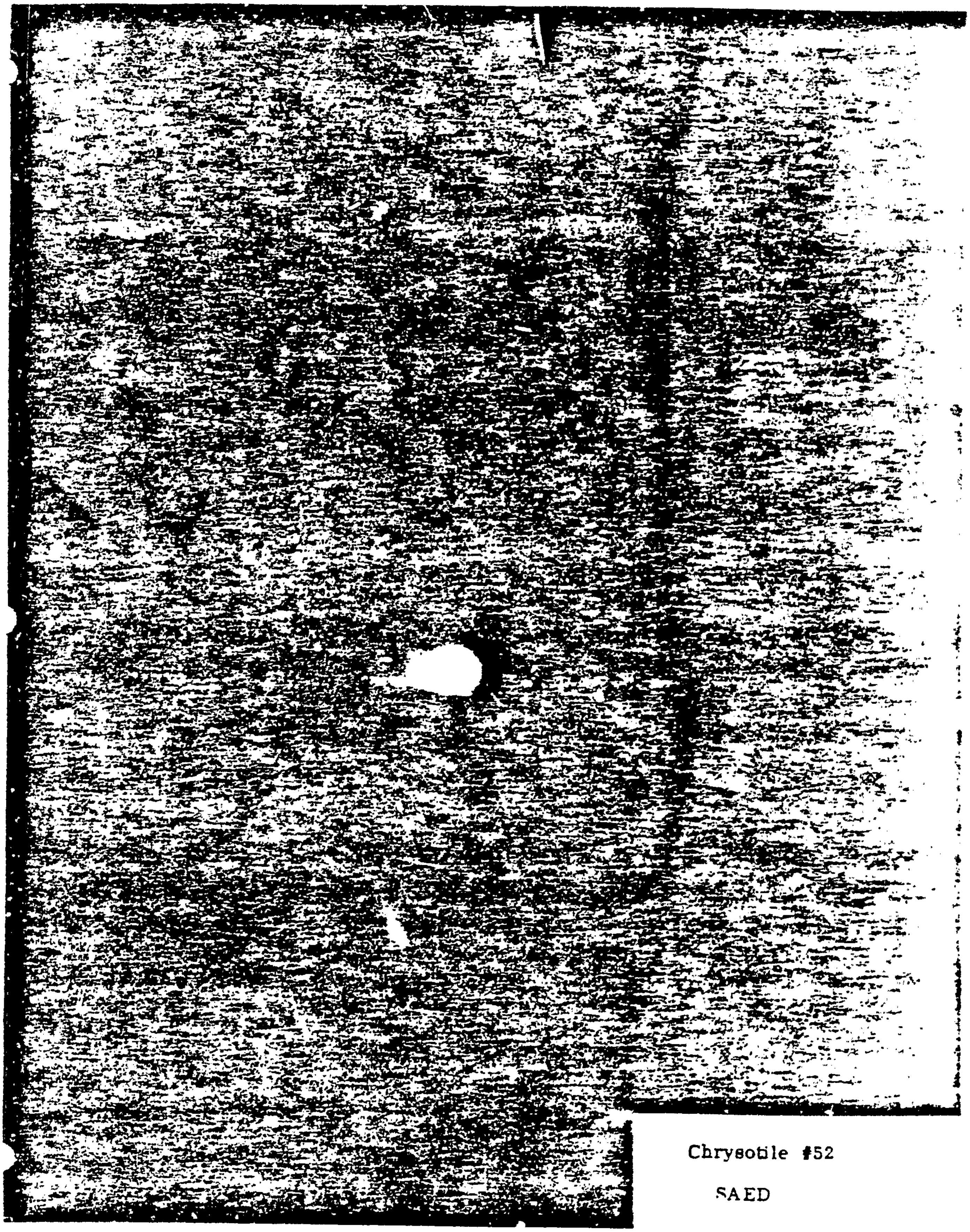
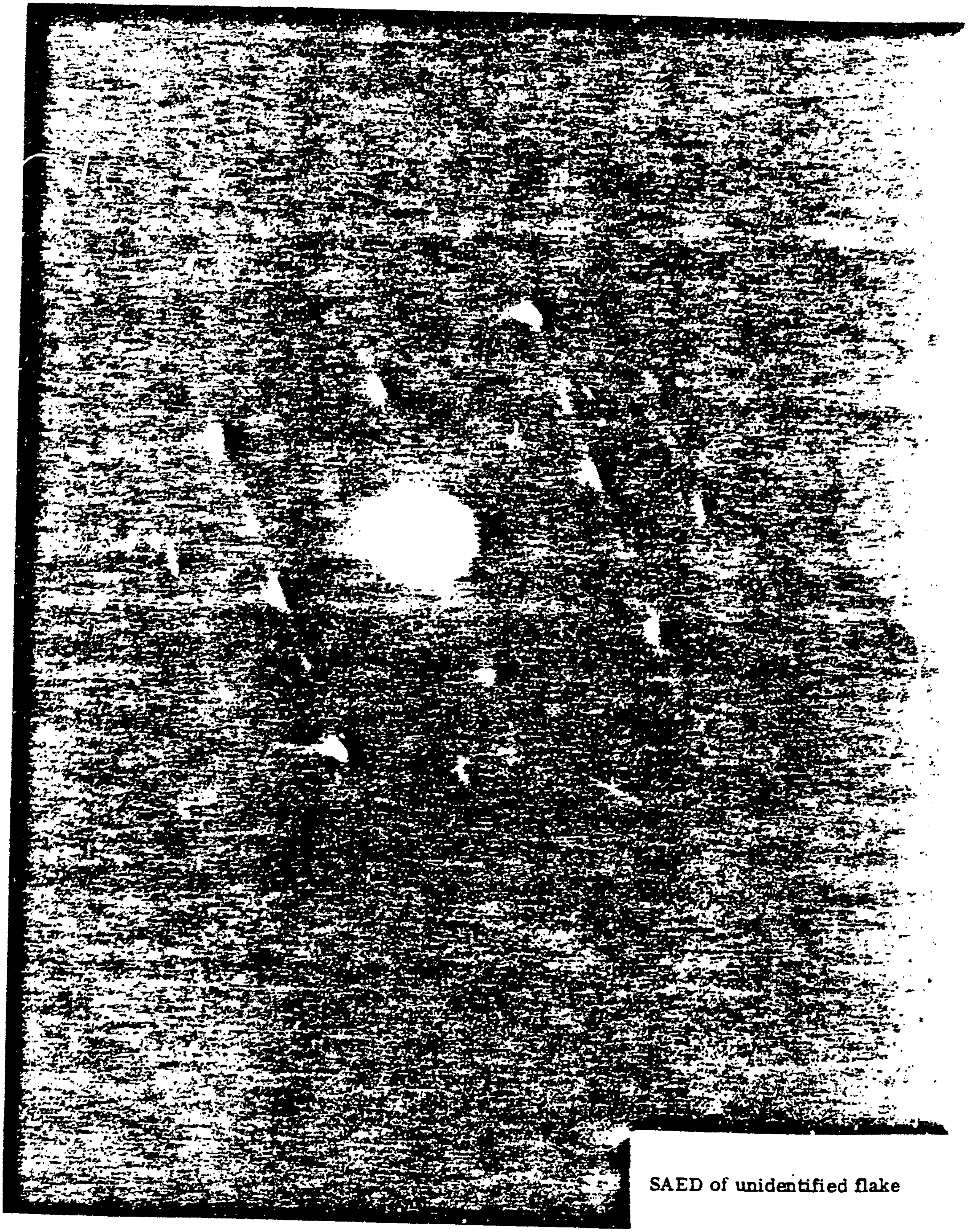
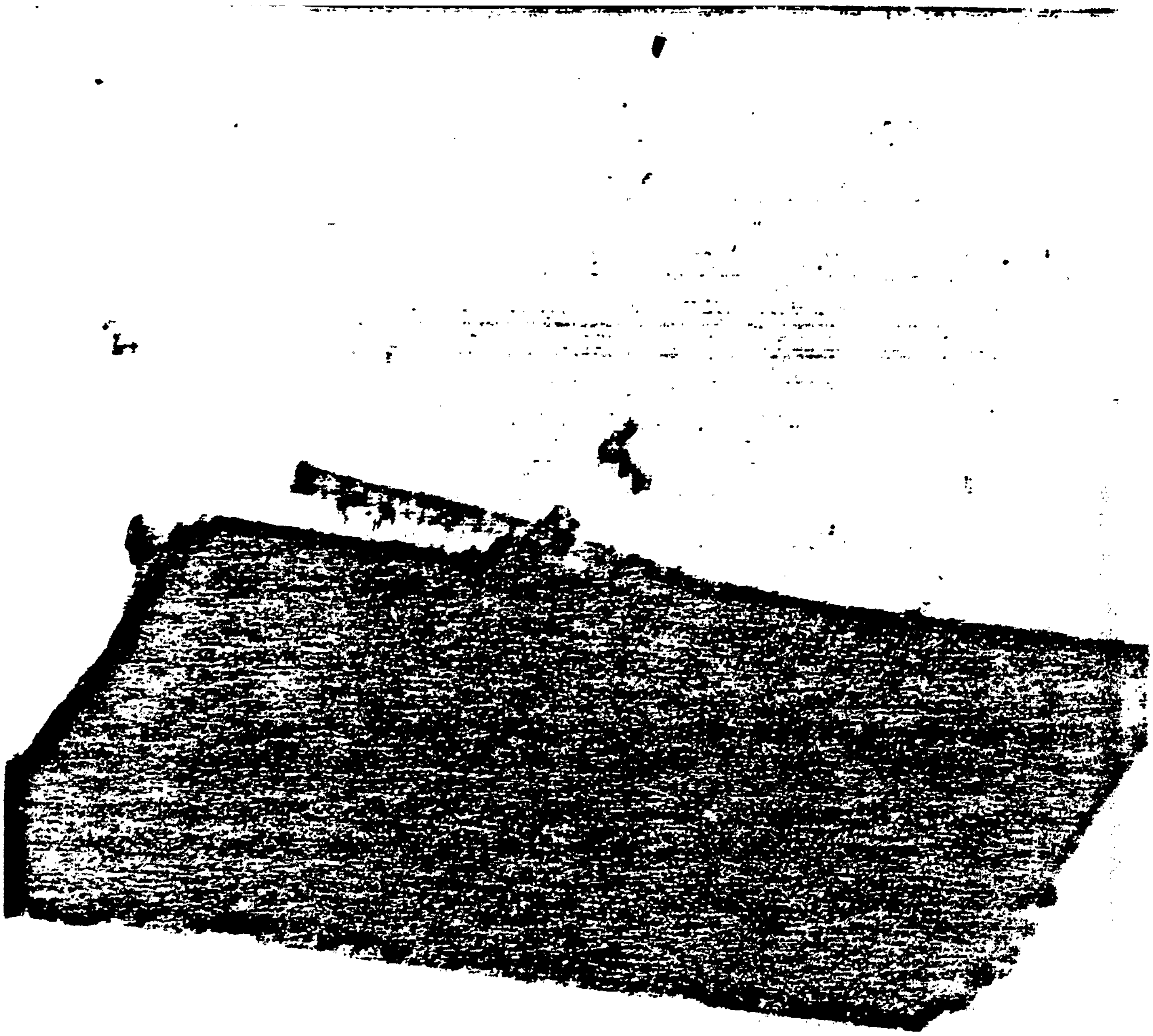


Chrysotile #52

SAED



SAED of unidentified flake



Inorganic in all samples
Unidentified flake
(50,000X)

EPA-450/2-78-014
(OAQPS No. 1.2-094)

SPRAYED ASBESTOS-CONTAINING MATERIALS IN BUILDINGS:
A Guidance Document

by

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Contract No. 68-02-2607
Work Assignment No. 4

EPA Task Officer: Carroll Specht

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

March 1978

OAQPS GUIDELINE SERIES

The guideline series of reports is being issued by the Office of Air Quality Planning and Standards (OAQPS) to provide information to state and local air pollution control agencies; for example, to provide guidance on the acquisition and processing of air quality data and on the planning and analysis requisite for the maintenance of air quality. Reports published in this series will be available - as supplies permit - from the Library Services Office (MD-35), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; or, for a nominal fee, from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

This Guidance Document was furnished to the Environmental Protection Agency by the GCA Corporation, GCA/Technology Division, Bedford, Massachusetts 01730, in fulfillment of Contract No. 68-02-2607, Work Assignment No. 4. The opinions, findings, and conclusions expressed are those of the authors and not necessarily those of the Environmental Protection Agency or the cooperating agencies. Mention of company or product names is not to be considered as an endorsement by the Environmental Protection Agency.

Publication No. EPA-450/2-78-014
(OAQPS Guideline No. 1.2-094)

ABSTRACT

The recognition of the potential health hazards from exposure to asbestos fiber and the increasing use of this mineral in many products over the past several decades has prompted the U.S. Environmental Protection Agency and other federal agencies to enact regulations for its safe handling to protect the public, the environment and the worker. This document is prepared for those involved in the use, removal, and disposal of asbestos materials in the building trades.

Asbestos in all its forms is considered a serious respiratory hazard. Individual fibers are invisible to the naked eye and their small size gives them prolonged buoyancy even in still air. Unlike most chemical carcinogens, the mineral fibers persist in the environment almost indefinitely and, when present in a building space open to its occupants, represent a continuous source of exposure. From a toxicological perspective, the latency period before onset of clinical signs is typically decades leading to a difficulty in linking cause and effect. Since the beginning of the century, asbestos has been used as a major constituent or an important additive to many consumer products so that there are many sources of exposure to the general public. In the past few tens of years several asbestos products have been sprayed on structural steel for fireproofing or have been sprayed as decorative coatings on ceilings.

With a view toward controlling exposures to the public, guidelines are presented for the detection and monitoring, removal or encapsulation, and disposal of asbestos-containing building materials. Measures available to protect workers and building occupants are presented based on field measurements and theoretical considerations. Sampling procedures are discussed so that the user of this document can take an active role in determining whether protective action is needed and, if so, how best to protect himself, the public, and the environment.

CONTENTS

PART I

ASBESTOS: BACKGROUND, ENVIRONMENTAL CONTAMINATION, STANDARDS, AND ANALYSIS

CONTENTS (continued)

CONTENTS (continued)

Control of Sprayed Asbestos Surfaces in School Buildings: A Feasibility Study

Report to the
National Institute of Environmental Health Sciences
June 15, 1978

William J. Nicholson, Ph.D.
Arthur N. Rohl, Ph.D.
Robert N. Sawyer, M.D.
Edward J. Swoszowski, Jr., B.S.
James D. Todaro, M.D.

ENVIRONMENTAL SCIENCES LABORATORY
MOUNT SINAI SCHOOL OF MEDICINE OF THE CITY UNIVERSITY OF NEW YORK

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subject: Asbestos Task Force - New York City Board of Education. March 8, 1979

Case #48106-3

date: March 12, 1979

from: C. P. Lichtenwalner

Mr. W. J. Schreibeis:

On March 8th I attended a presentation by the Asbestos Task Force of the New York City Board of Education at 111th Street between 5th and Lenox Avenues in New York City with Mr. Norman Wood of the New York Telephone Company. This presentation was given to contractors and school board members to explain the methods that would be used for controlling asbestos in New York City schools.

The coordinator of the Asbestos Task Force gave a brief talk on where asbestos is used in the schools and discussed some of the properties of fibrous asbestos. Afterwards, a slide presentation was given describing in detail the methods that will be used in removing asbestos insulation in school buildings. In some places where asbestos is present, the material will not be removed but will be encapsulated with a spray-on material (currently they are using Decadex Fire Check and will continue to use this until they get a list of approved materials from the EPA). In other places the asbestos insulation will be contained by boxing-in the insulation with gypsum board and then covering the board with ceiling tiles. When the insulation will be contained by these encapsulation or boxing-in techniques, the extensive safety precautions necessary for removal will not be necessary. These removal precautions were given in the slide presentation. The precautions used were:

1) prior to containment all moveable items of furniture in the area were removed.

2) All vents, ducts, doors, windows, etc., were sealed with polyethylene sheets.

3) All floors and walls were covered with polyethylene sheets using duct tape for sealing (.006 inches on the floors and .004 inches on the windows).

4) Full protective clothing was required for all employees entering the worksite; this includes head and foot coverings. Respirators to be worn must be NIOSH certified.

5) A shower facility .as constructed out of polyethylene sheeting and a sump pump and was connected via an air lock to the worksite.

6) Before leaving the worksite employees stripped off the protective clothing leaving it in the contaminated area, they then entered the showers wearing only the respirator and showered while wearing respirators.

7) All removal procedures were handled in a wet state. The wetting agent contained a material called Aqua-Gro. The insulation was sprayed with the wetting agent, then scrubbed off. Several passes of wetting and scrubbing were required for complete removal.

8) Disposal of all materials was done in double walled plastic bags.

9) The disposed material must be sent to an approved dump and covered with at least 3 feet of fill.

10) At the conclusion of operations all walls were sponged down and all floors were wet mopped at least twice. No vacuuming was allowed.

At the conclusion of the slide presentation we were shown areas in the school building where these three techniques, removal, encapsulation and containment, were being done. I found the presentation extremely interesting and I think it might be useful if we could either obtain a copy of the slide presentation or perhaps invite one of the people to give a talk here at Bell Labs. I have found the people very helpful in answering any questions I had. The contact seems to be Ms. Brandes at 212-361-7711 x372.

CPLichtenwalner

MH-7885-CPL-cls C. P. Lichtenwalner

Copy to

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D. G. Hodgkins	J. M. Degen
N. F. Saccente	R. W. Stone, M.D.
G. M. Wilkening	
N. Wood	