HETA 86-434-1833
SEPTEMBER 1987
FEDERAL OFFICE BUILDING
EVANSVILLE, INDIANA

NIOSH INVESTIGATOR:
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I. SUMMARY

On July 3, 1986, the National Institute for Occupational Safety and Health (NIOSH) received a request from the President of the American Federation of Government Employees, Local 3448, to evaluate potential asbestos contamination at the Federal Office Building in Evansville, Indiana.

An environmental evaluation of the facility was conducted on November 18-19, 1986, which included collection of air, bulk, and surface samples for asbestos. One air sample, of the 30 collected, contained asbestos in trace quantities at 0.005 fibers/cm^3 (fibers per cubic centimeter), which is below the NIOSH guideline of 0.01 fibers/cm^3. Nine out of 68 surface samples (settled dust) taken at several locations within the building had detectable levels of amosite and chrysotile asbestos. Bulk sample results confirmed that the sprayed-on fireproofing contained between 1-7% chrysotile asbestos. Visual inspection indicated that the fireproofing is friable and has some water damage. The fireproofing is deteriorating, exposed in the return air plenum, and is accessible through the ceiling tiles.

It was determined that a high potential exists for asbestos fiber release based upon air samples, surface samples and by visual inspection. The surface contamination indicates that asbestos was previously present in the air at several locations within the building. Based on these findings we have determined that a potential health hazard exists. Recommendations to reduce exposure are included in Section VIII of this report including: removal of the asbestos, operation and maintenance procedures, surveillance and medical monitoring programs, and education of employees.

KEYWORDS: SIC 9199, office building, office workers, asbestos.

II. INTRODUCTION

On July 3, 1986, NIOSH received a request for a health hazard evaluation at the Federal Office Building in Evansville, Indiana. The request was submitted by the President of the American Federation of Government Employees Local #3448 who was concerned about possible exposure to asbestos by the building occupants. On November 18-19, 1986, NIOSH investigators conducted an environmental survey at the Federal Office Building.

III. BACKGROUND

The Federal Office Building is a three floor, rectangular office structure built in 1963. The U.S. Postal Service owns the building and leases the office space to approximately 20-30 Federal agencies. During construction, structural beams and the underside of the steel floor decks were sprayed with an asbestos-containing fireproofing. Bulk sample data have shown this fireproofing to contain from <1 to 7 percent chrysotile asbestos. In the occupied spaces, suspended ceilings form a plenum with the floor decks which is used to return office air to the heating, ventilating, and air-conditioning (HVAC) systems. This directly exposes the friable asbestos-containing fireproofing in the plenum to the HVAC air, which is subsequently returned to the occupied areas.

On November 18-19, 1986, an on-site evaluation of the facility was conducted by NIOSH industrial hygienists. During this evaluation, a walk-through tour of the facility was conducted to inspect the existing fireproofing and the HVAC systems. Information concerning facility operations was obtained from discussions with Postal Service management and staff. Additionally, 30 air samples, 66 surface samples, and 14 bulk samples were collected and analyzed for asbestos.

IV. Methods and Materials

A. Air/Surface Samples

Air samples were collected from stationary positions at a height approximating the breathing zone of the occupants, using Nuclepore 25mm mixed cellulose ester filters (open face) and battery-powered sampling pumps operating at 2.0 liters per minute (lpm).

The air samples were analyzed for asbestos using transmission electron microscopy (TEM). A section was cut from each filter with a number 6 cork borer and prepared for TEM analysis via the Zumwalde-Dement procedure outlined in NIOSH Publication Number 77-204. At least one hundred fields having a total area of 0.706mm^2 were examined on each preparation. Fiber counting and sizing were performed at a magnification of 10,000X. X-ray spectra and selected area electron diffraction (SAED) patterns (where warranted) were obtained for identification of the fibrous constituents on the filters.

Surface samples (settled dust on smooth interior surfaces) were collected on filters using the sampling pumps previously described. To obtain these samples, the filter cassette was brushed across the surface to be sampled several times in a fashion similar to the action of a vacuum cleaner. These samples were analyzed by TEM as previously described.

B. Bulk Samples

Bulk samples of fireproofing, insulation, settled dust and other pertinent materials were obtained in glass vials. Analysis for asbestos was performed by polarized light microscopy (PLM).

PLM analysis was done using an Leitz Dialux 20 polarizing light microscope at a power of 160X. Percentage of asbestos was estimated by a visual examination of fibers with an aspect ratio of 3:1 or greater and reported as percent by volume.

V. EVALUATION CRITERIA

A. Environmental 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 exposure limits, by contrast, are based primarily 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 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.

B. Toxicity

Increased health risk resulting from occupational exposure to asbestos has been well documented in the scientific literature. Initially, asbestos was associated with a chronic and debilitating lung disease called asbestosis which normally occurred following long-term exposures to high levels of asbestos fibers. More recently, asbestos has also been linked to several types of cancer, including mesothelioma (a rare cancer of the chest and abdominal lining) and cancers of the lung, esophagus, stomach, and colon. These cancers usually appear many years after the initial contact with asbestos, and sometimes result from short-term and/or low level exposures. This indicates that there may not be a "safe" level of exposure to asbestos for the elimination of all cancer risk. Additionally, cigarette smoking in combination with asbestos exposure greatly increases the risk of developing lung cancer.[1]

C. Evaluation Criteria

NIOSH recommends that occupational exposure to asbestos be kept to the lowest feasible level that can reliably be determined. This recommendation is based on the proven human carcinogenicity of asbestos and on the absence of a known threshold exposure level below which there is no risk of cancer. For most industrial settings, the lowest feasible limit for reliable detection of asbestos using phase contrast microscopy corresponds to a level of 0.1 fibers/cm^3. NIOSH has used 0.01 fibers/cm^3 in non-industrial settings as a guideline for contamination assessment, because of the relative absence of background contamination. This level of airborne asbestos contamination can reliably be determined by the phase contrast method of analysis, and is significantly above naturally occurring concentrations.[2]

The American Conference of Governmental Industrial Hygienists, an independent scientific body, recommends that chrysotile asbestos exposures be limited to 2 fibers/cm^3 averaged over an 8-hour workday (with the notation that asbestos is a human carcinogen).[3] The Occupational Safety and Health Administration (OSHA) standard for asbestos limits exposure to 0.2 fibers/cm^3 averaged over an 8-hour workday.[4]

VI. RESULTS

Table I presents the results of the bulk samples. One of the settled dust bulk samples (U.S. District Court/Clerk of Courts Office) contained a trace amount of chrysotile asbestos (<1%). Two of the three fireproofing bulks contained 1 - 7% chrysotile asbestos.

Table II presents the results of the air samples. One of the samples (Social Security/Top of Filing Cabinets) contained asbestos fibers in trace quantities (0.005 fibers/cm^3). This sample was below the NIOSH guideline of 0.01 fibers/cm^3.

Table III presents the surface samples that had detectable levels of amosite and chrysotile asbestos, which would indicate that asbestos was present in the air (at some point in time) at those locations in the facility. Table IV presents the results of the surface samples in which no detectable levels of asbestos were found.

Our visual inspection indicated that the fireproofing is friable in some locations and has suffered water damage in other locations. Judging from the fireproofing debris that have fallen onto the top of the suspended ceiling tiles, the adhesive qualities of the fireproofing may have deteriorated. Additionally, the fireproofing is exposed in the return air plenum and is accessible when the ceiling tiles are removed for maintenance or other reasons.

VII. DISCUSSION AND CONCLUSIONS

The chrysotile and amosite fibers found on several interior surfaces is suggestive of historic airborne asbestos. Although only one air sample was shown to have detectable levels of asbestos fibers, airborne contamination is episodic; dependent upon disturbance of the asbestos-containing material.

It is the opinion of the NIOSH investigators that the potential for fiber release is relatively high. This opinion is based upon our visual observations and environmental samples, as outlined in the results section. This potential was evident at several locations throughout the building.

VIII. RECOMMENDATIONS

Based on this evaluation, the NIOSH industrial hygienists recommend that the asbestos-containing fireproofing be completely removed as soon as practical. This removal should be performed by a reliable contractor experienced in asbestos abatement. It is also recommended that the HVAC system be checked for asbestos contamination and cleaned if necessary.

Prior to the removal of the fireproofing, the building can be used for normal work activities providing certain interim precautionary measures are taken to minimize the employees' potential exposure to airborne asbestos.

1. Isolate the asbestos-containing fireproofing from the supply air source. This can be accomplished most simply by setting the HVAC systems in the 100% single-pass ventilation mode (0% recirculation of exhausted air).

2. Use only wet janitorial techniques to prevent the re-dispersion of settled dust. Initially, all uncarpeted floors should be thoroughly wet mopped and all furnishing surfaces should be thoroughly damp wiped to remove previously settled dust. Thereafter, these wet janitorial techniques should be used for routine cleaning purposes.

   Additionally, all carpeting and upholstered furnishings should be cleaned only with a high-efficiency particulate air (HEPA) filter vacuum system. The HEPA vacuum(s) should also be regularly maintained per the manufacturer's recommendations to ensure integrity of operations.

3. Establish surveillance program to monitor the facility. The surveillance program should include at least the following three components: visual inspection, environmental monitoring, and medical monitoring. A visual inspection should be done on a routine basis to search for signs of further damage to the fireproofing (e.g., water leaks). Environmental monitoring should be conducted periodically to evaluate the occupied office space for airborne and settled asbestos dust.

   Determining if any employees should be included in a medical monitoring program for the type of asbestos exposure experienced here is difficult. The employees with the greater potential exposure would be maintenance and janitorial workers. They could be offered a medical surveillance program, including annual medical and work history, physical examination, and pulmonary function tests. A chest x-ray should be offered at a frequency of 5 years to 1 year, depending on the worker's age and exposure history (4). The chest X-ray should be interpreted using the standard international pneumoconiosis classification (5). However, exposure to asbestos at very low levels is unlikely to result in any appreciable X-ray changes, impaired pulmonary function, or other examination abnormalities. Therefore, medical surveillance is probably not warranted for other employees (e.g., office workers), but could be available to individuals who are greatly concerned about this potential exposure.

4. Design maintenance procedures to minimize the potential for asbestos exposure. Whenever possible, maintenance activities should be performed in the occupied space with a minimum of vibration-producing activity and without the removal of suspended ceiling tiles. If the temporary removal of suspended ceiling tiles is required, then special precautions will be necessary to minimize the potential for asbestos exposure during the maintenance activity. For maintenance situations where a ceiling tile must temporarily be removed but the fireproofing will not be directly contacted, the following precautions are suggested:

   (a) perform the maintenance activity after normal business hours when the area will not be occupied.

   (b) ensure that the air pressure in the office space is positive, with respect to the area above the suspended ceiling, using a smoke test kit.

   (c) require the maintenance operator to wear a respirator approved by NIOSH-MSHA for asbestos. Respirator use should conform to the OSHA requirements for general industry as described in 29CFR 1910.134. It also may be prudent to require the maintenance operator to wear a disposable hood and smock during the maintenance activity.(d)gently remove the ceiling tile(s) to a position above adjacent unmoved tiles and perform the maintenance activity in such a manner as to minimize unnecessary vibration and air movement.

   (e) gently replace the ceiling tile(s) and clean the immediate office area using wet janitorial techniques and a HEPA vacuum as appropriate. Respirator cartridges and any disposable clothing should be sealed in plastic bags prior to placing them in the facility's waste receptacle.

For maintenance situations where the fireproofing must be directly contacted (e.g., sawing, drilling, cutting) or removed, full isolation and containment procedures should be used.

5. Educate employees concerning the hazards of asbestos. Employees should be informed of the hazards associated with asbestos exposure and the precautionary actions necessary.

These five recommended precautions are not meant to be long-term solutions to this situation. They are intended only to serve as interim measures over the short-term until complete removal of the fireproofing can be accomplished.

IX. REFERENCES

1. Unpublished letter dated August 6, 1984. Letter from Kenneth Wallingford (NIOSH) to Mr. L.L. Mitchell (Commissioner, Public Buildings Service, General Services Administration) concerning potential asbestos exposure at the Federal Building and Courthouse, San Francisco, California.

2. Testimony of the National Institute for Occupational Safety and Health. On the Occupational Safety and Health Administration Public Hearing: Occupational Exposure to Asbestos. June 21, 1984.

3. American Conference of Governmental Industrial Hygienists. Threshold Limit Values and Biological Exposure Indices for 1986 - 1987. Cincinnati, Ohio: ACGIH, 1986.

4. Occupational Safety and Health Administration. Occupational Exposure to Asbestos. 29 CFR 1910.1001. Occupational Safety and Health Administration, June 20, 1986.

5. International Labour Organisation. Guidelines for the use of the ILO international classification of radiographs of pneumoconiosis, revised ed. Geneva: International Labour Organisation, 1980. [Occupational Safety and Health Series, No. 22 (Rev)].

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XI. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, Publications Dissemination Section, 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. American Federation of Government Employees, Local 3448
2. U.S. Postal Service, Evansville, Indiana
3. NIOSH, Cincinnati Region
4. 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
Bulk Sample Results
Federal Office Building
Evansville, Indiana
HETA 86-434
November 18-19, 1986

LOCATION	ASBESTOS DETERMINATION (Percent and Type) PLM ANALYSIS
U.S. District Court/Clerk of Courts Rm. 304 (Top of Filing Cabinet)	§1% Chrysotile
Return Air Grille, In Hallway Outside Rm. 356	ND
Return Air Grille, In Hallway Outside Rm. 348	ND
Fireproofing Material, Men°s - 3rd Floor Upper Surface of Ceiling Tiles	ND
Wall Outside Judges Chambers, Rm. 310-I Material leaking from Wet Ceiling	ND
Wall Outisde Rm. 313 B Material Leaking from Wet Ceiling	ND
Electrical Room, Rm. 243, Fireproofing From Upper Surface of Ceiling Tiles	1 - 2% Chrysotile
Dust Behind Pop Machine Across From Elevator	ND
Fireproofing Material Coming Through Ceiling Diffuser	5 - 7% Chrysotile
Settled Dust in Fan Housing Return Air HVAC	ND
Filter Material From Supply HVAC	ND
Filter Material From Return HVAC	ND
Filter Material From District Court HVAC Unit	ND
Filter Material From Bankruptcy Court HVAC Unit	ND

PLM = Polarized Light Microscopy
ND = None Detected

TABLE II
Air Sample Results
Federal Office Building
Evansville, Indiana
HETA 86-434
November 18-19, 1986

LOCATION	SAMPLE DESCRIPTION TIME	VOLUME (LITERS)	ANALYTICAL RESULTS/TEM ANALYSIS ASBESTOS FIBERS/cm^3
Social Secruity, Top of Filing Cabinets, Close to Main Entrance	07:52-16:38	1052	0.005
Social Security, Top of Bookcase, Northwest Corner	07:55-16:39	1048	ND
Social Security, Top of Bookcase, Across from Rm. 101-C	07:57-16:41	1048	ND
Social Security, Computer Room 101-C Top of Filing Cabinet	07:59-16:43	1048	ND
Social Security, Break Room, Top of Television	08:05-16:47	1048	ND
Social Security, Annex, Top of Coat Rack	08:07-16:48	1042	ND
Senator Quayle and Lugar°s Office (Secretaries Office)	08:09-16:50	1042	ND
Congressman McCloskey°s Office (Bookcase - Secretarial Area)	08:11-16:51	1040	ND
Army Recruiting Station, Rm. 108 Top of Coatrack	08:14-16:49	1030	ND
Hearing and Appeals, Rm. #246 Top of Filing Cabinet (Entrance)	08:16-16:55	1038	ND
Hearing and Appeals, Rm. 246 Top of Filing Cabinet	08:18-16:56	1036	ND
IRS, Rm. 216, Top of Filing Cabinet	08:20-16:59	1038	ND
IRS, Rm. 226, Top of Forms Cabinet	08:24-17:00	1032	ND
IRS, Hallway Outside Rm. 216	08:26-16:58	1024	ND

TEM = Transmission Electron Microscopy
ND = None Detected; estimated limit of detection for TEM analysis is 0.005 fibers/cm^3 (1 fiber/100 fields, 1050 liter sample volume).

TABLE II (Continued)

Air Sample Results
Federal Office Building
Evansville, Indiana

HETA 86-434
November 18-19, 1986

SAMPLE DESCRIPTION			
LOCATION	TIME	VOLUME (LITERS)	ANALYTICAL RESULTS/TEM RESULTS ASBESTOS FIBERS/cm^3
Department of Agriculture, Rm. 272 Top of Coat Rack	08:28-17:01	1022	ND
Department of Agriculture, Rm. 271 Top of Filing Cabinet	08:30-17:02	750	ND
First Floor Lobby, Between Elevators on Shelf	08:35-17:04	1018	ND
U.S. District Court, Rm. 304 Clerk of Courts	08:32-16:53	1006	ND
U.S. District Court Room, Rm. 301	08:42-22:05	1605	ND
Reception Area to Judges Chamber Rm. 310	08:48-17:05	994	ND
Court Security Office, Rm. 333 Top of Coat Rack	08:51-17:07	992	ND
U.S. Marshall°s Office, Rm. 332 Top of Filing Cabinet	08:52-15:10	756	ND
U.S. Bankruptcy Clerks Office Rm. 352, Top of Bookcase	08:56-17:10	988	ND
Hallway Outside Rm. 352 on Emergency Light	09:02-17:08	972	ND
U.S. Bankruptcy Court, Judge°s Bench	09:05-17:12	974	ND
U.S. Bankruptcy Court, Law Library Top of Bookcases	09:11-17:11	960	ND
Ambient Air	09:16-17:15	960	ND

TEM = Transmission Electron Microscopy
ND = None Detected; estimated limit of detection for TEM analysis is 0.005 fibers/cm^3 (1 fiber/100 fields, 1050 liter sample volume).

TABLE III

Surface Sample Results
Federal Office Building
Evansville, Indiana

HETA 86-434
November 18-19, 1986

Location	Analytical Results/TEM Analysis			
	Width (um)	Length (um)	Fiber Type	# Present
U.S. District Court Clerk°s Office/Top of Filing Cabinets	0.2 - 1.0	4 - 15	Chrysotile	7
U.S. District Court/Outside of Judge°s Office/Rm. 310-I/Vacuum Carpet	§0.1 - 0.8	12 - 14	Chrysotile, Amosite	2
Electrical and Storage Room/Across From IRS	1.0 - 1.5	12 - 30	Chrysotile, Amosite	2
Electrical and Storage Room/Top of Electrical Boxes/Room 243	§0.1 - 0.4	1 - 8	Chrysotile	65
Telephone Equipment Room/1st Floor/Top of Door	§0.1 - 0.4	1.5 - 15	Chrysotile	6
U.S. Senators Office/Horizontal Surfaces	§0.1 - 0.4	§1 - 24	Chrysotile, Amosite	19
Top of Building Directory/1st Floor Lobby	§0.1 - 15	1 - 15	Chrysotile, Amosite	3
Social Security/Computer Room/Window Shades	§0.1 - 0.4	§1 - 20	Chrysotile	63
Social Security/Stockroom/Top of Light Fixture	§0.1 - 15	§1 - 60	Chrysotile, Amosite	49

TEM = Transmission Electron Microscopy
UM - Micrometer

TABLE IV
Surface Sample Results
Federal Office Building
Evansville, Indiana
HETA 86-434
November 18-19, 1986

LOCATION	ANALYTICAL RESULTS/TEM ANALYSIS ASBESTOS DETERMINATION
Roster/Outside 3rd Floor Elevator	ND
Ledge/Top of Pay Phone/3rd Floor	ND
Ledge/Top of 3rd Floor Elevators	ND
Vacuum Carpet/Outside Rm. 352	ND
Bankruptcy Court Clerks Office/Top of Dividers & Bookcases	ND
Vacuum Carpet/Bankruptcy Court Clerks Office	ND
Bankruptcy Court/Judges Bench	ND
Bankruptcy Court/Ledges Over Doors	ND
U.S. District Court Clerk°s Office/Window Ledges	ND
" " " Judge°s "/Rm. 310-I Over Door Ledge	ND
" " " " Chambers/Top Book Shelves	ND
" " " Law Library/Rm. 310-B/Book Shelves	ND
Court Security Office/Rm. 333/Vacuum Surfaces	ND
Ledge Over 2nd Floor Elevator	ND
Top of Pop Machine/2nd Floor	ND
Hearing adn Appeals/Top of Room Dividers-Partitions	ND
Main Hearing Room/Rm 246B/Door and Window Ledges	ND
Hearing and Appeals/Lunchroom/Vacuum Carpet	ND
Department of Agriculture/Rm 271/Top of Bookcase	ND
Hallway outside Room 250/Top of emergency Lighting	ND
Department of Agriculture/Rm 272/ Top of Coatrack	ND
Outside Room 272/Top of Exit Light	ND

TEM = Transmission Electron Microscopy
ND = None Detected

TABLE IV (Continued)

LOCATION	ANALYTICAL RESULTS/TEM ANALYSIS ASBESTOS DETERMINATION
IRS/Rm. 216/ Top of Partitions	ND
IRS/Rm. 216/Window Ledges	ND
IRS/Rm. 224-A/Vacuum Carpet	ND
IRS/Rm. 224-A/Top of Forms Cabinet and Partitions	ND
Emergency Use only Box/Between 1st Floor Elevators	ND
Top of 1st Floor Elevator Ledges	ND
Outside Room 142/Vacuum Floor Under Water Fountain	ND
Congressman McCloskey°s Office/Rm. 124/Top of Supply Cabinet	ND
Top of Door Ledge/Brian Hasler°s Office	ND
U.S. Army Recruiting Office/Top of Partitions	ND
Social Security/Annex Room/Along Floor Molding	ND
Lunch Room/1st Floor/Top of Television and Window Shades	ND
Social Security/Top of Filing Cabinets	ND
Social Security/Floor Molding	ND
Social Security/Window Shades	ND
Social Security/Top of Perimeter Heaters	ND
Social Security/Computer Room/Floor Molding	ND
Social Security/Data Review Unit/Floor Next to Molding	ND
Social Security/Data Review Unit/Window Shades	ND
Social Security/Top of Susan Hansen°s Desk	ND
Social Security/Electrical Outlet/Susan Hansen°s Desk	ND
Social Security/Top of Joanne Dick°s Desk	ND
Social Security/Stockman/Desk Under Replaced Ceiling Tile	ND
Social Security/Stockman/Surface Top of Ceiling Tile	ND

TEM = Transmission Electron Microscopy
ND = None Detected