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U.S. Army Toxic and Hazardous Materials Agency
**Report of Sampling and
Analysis Results**

Dorseyville Army Housing Units
Dorseyville, Pennsylvania

August 1990

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**SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
DORSEYVILLE, PENNSYLVANIA**

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EXECUTIVE SUMMARY

The U.S. Army family housing units (FHUs) at Dorseyville, Pennsylvania were inspected by Roy F. Weston, Inc. (WESTON) personnel during March 1990 to further evaluate the environmental concerns identified in the enhanced Preliminary Assessment reports prepared and submitted earlier by Argonne National Laboratory (ANL) for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Three of the 16 single-family "Capehart" housing units were examined on 01 March to investigate the possible presence of asbestos-containing materials (ACM). An assessment of airborne asbestos exposure was performed at one unit on this property on 17 April 1990 by a WESTON Certified Industrial Hygienist (CIH), because asbestos fibers were detected in the dust deposited within the ductwork of the heating system.

The ANL Draft Sampling and Analysis Plan, Revision 1 (SAP) specified sampling the following materials, where present, which are suspected to contain asbestos, from ten per cent of the housing units or a minimum of three housing units, whichever is greater.

- Pipe run insulation.
- Dust accumulated inside heating ductwork within the concrete slab, where present and open.
- Vinyl floor tiles.

The WESTON personnel selected three housing units for inspection after review of maintenance records and drawings, discussions with housing management personnel, and determination that the units were in similar condition. The housing units chosen, Nos. S-013, S-016, and S-019, were considered to be representative of the other 13 units, but this was not confirmed by an examination of all the units.

Twelve dust samples, 18 samples of vinyl floor tile, one expansion joint, and six samples of pipe run insulation were collected by WESTON and analyzed. These analyses revealed that asbestos is present in dust accumulated within the heating ductwork, in floor tile, and in attic pipe run insulation at the three housing units examined. Asbestos was found in ten of the 12 dust samples by transmission electron microscopy (TEM) in at least two samples from each unit. Asbestos was quantified at 1% or greater by polarized light microscopy (PLM) in all 18 floor tile samples. Asbestos was found at or greater than 1% in all six pipe run insulation samples by PLM. No asbestos fibers were detected by PLM in the expansion joint sample. During the asbestos sampling activity, no other suspect materials were observed.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- The friable asbestos-containing pipe run insulation in the attic is located in an inaccessible area and may be left in place as long as it is not disturbed. However, an Operations and Maintenance (O&M) Plan must be developed and implemented. This program must describe the locations of all known ACM, procedures for its maintenance, repair and removal, and personnel responsible for its implementation. The O&M program must remain in force until such time as all ACM is removed from the facility.

- The risks posed by the asbestos-containing dust in the ductwork cannot be clearly evaluated, because the sampling and analysis program only included a qualitative screening of this material since no approved quantitative procedure exists. Further studies, such as air sampling were recommended to determine if asbestos is becoming airborne and to define what risks, if any, are presented by these findings. These studies were subsequently performed and the findings are presented in this report.
- The vinyl floor tiles pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. They should be managed in place under an O&M program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged.

Samples for airborne asbestos were collected from four floor vents, one located in each of the living room, kitchen, bedroom, and bathroom, in an unoccupied unit which had been inspected previously. The air samples were subjected to analysis by TEM to identify and quantify any asbestos fibers collected. The sample volume collected resulted in detection limits for air airborne asbestos fiber concentrations of <0.004 fibers per cubic centimeter (f/cc). No airborne asbestos fibers were detected at this FHU property, using sampling techniques designed to simulate the worst-case concentration likely to be encountered.

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SECTION 1. INTRODUCTION

**SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
DORSEYVILLE, PENNSYLVANIA**

SECTION 1. INTRODUCTION

Roy F. Weston, Inc. (WESTON) was retained by Argonne National Laboratory (ANL) to provide assistance in gathering additional environmental data for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) at 53 family housing unit (FHU) properties in 12 states. The Dorseyville, Pennsylvania property is one of these FHUs.

1.1 PURPOSE AND SCOPE

The purpose of this project was to provide the Department of the Army with sound environmental data on the properties which are scheduled for sale or realignment as a result of the Defense Authorization Amendments and Base Closure and Realignment Act (Public Law 100-526). Environmental assessments of each property covered by the Act are required by the Secretary of Defense prior to their closure or realignment. Such actions must be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA) to ensure that any environmental hazards will be identified and mitigated where required.

Previously, ANL conducted enhanced preliminary assessments (PAs) for each property. These enhanced PAs made recommendations regarding sampling and analysis to determine (1) whether and in what quantities asbestos is present in certain building construction materials (including pipe run insulation, dust accumulated in heating ductwork, vinyl floor tile, and exterior siding shingles, where present), (2) in selected contexts, whether and in what concentration soils and groundwater may be contaminated, and (3) whether and in what range transformer oils at selected sites may contain polychlorinated biphenyls (PCBs). WESTON gathered this data by implementing ANL's Draft FHU Sampling and Analysis Plan, Revision 1 (SAP). Subsequent to the initial studies, WESTON, ANL, and USATHAMA decided that a follow-up effort was required to determine if asbestos fibers were becoming airborne from the dust in the heating system. This study was implemented, and samples were collected to evaluate any risks to occupants from this source.

1.2 SITE DESCRIPTION

The Department of the Army's FHU property in Dorseyville, Pennsylvania consists of 16 single-family housing units located on 11.48 acres. The units are located on a single curved street with nine units on the north side of seven on the south side.

The three-bedroom "Capehart"-style single-family housing units were constructed in 1959. The single-story, wood-frame units were built on concrete slab foundations with no basements or crawl spaces. The ducts for the original heating system and domestic water lines were embedded in the concrete slab, which was covered with vinyl floor tile. The units have pitched roofs surfaced with asphalt shingles and the exteriors finished with wood siding.

1.3 REPORT ORGANIZATION

This report contains the results of the sampling and analysis program performed by WESTON. Section 2 contains a description of the asbestos sampling performed at the property and laboratory results for samples of suspected asbestos-containing material (ACM) collected. Copies of field notes and laboratory results pertaining to asbestos are provided in Appendices A.1 and A.2. Section 3 presents a description of the field sampling activities and results of the analyses for airborne asbestos fibers. Field notes and copies of the laboratory reports for this effort are presented in Appendices B.1 and B.2, respectively. Section 4 is a summation of all activities and findings for the Dorseyville FHU.

SECTION 2. ASBESTOS-CONTAINING MATERIALS

SECTION 2. ASBESTOS-CONTAINING MATERIALS

WESTON personnel inspected three of the 16 "Capehart" units at the Dorseyville family housing facility on 01 March 1990 for the presence of suspected ACM. Vinyl floor tile, pipe run insulation, expansion joint, and dust accumulated within the heating ductwork were the only suspect materials found within the buildings that were sampled. All sampling was done following the requirements of ANL's SAP. Additionally, all field work was performed in accordance with applicable Federal regulations, including 40 CFR Part 61 Subpart M, 40 CFR Part 763 Subpart E, and 29 CFR Part 1910.1001.

2.1 SAMPLING RATIONALE

The sampling rationale used by WESTON for this project followed the recommendations set forth by ANL. The type of suspect ACM to be sampled, the number of housing units to be examined at each FHU facility, and number of samples to be taken for each material found were described in the SAP. The plan for Dorseyville required sampling of the following materials, if present:

- Pipe run insulation.
- Accumulated dust inside heating ductwork if not sealed.
- Vinyl floor tiles.

In accordance with the SAP, three units were examined at this facility. The sampling plan, however, did not identify specific units which were to be sampled. The task of determining which housing units were representative of the facility as a whole and, therefore, would be sampled was left to the WESTON field team. After reviewing all available maintenance records and drawings and discussing the facility with Directorate of Engineering and Housing (DEH) personnel, it was determined that all of the units at the Dorseyville FHU were similar in condition. Units S-013, S-016, and S-019, were chosen by the WESTON field team leader as representative units to be sampled.

The SAP specifies that a minimum of two pipe run insulation samples, four dust samples, and one sample of each color of floor tile be collected from each of the housing units examined. Twelve dust samples, six pipe run insulation samples, one expansion joint, and 18 samples of vinyl floor tiles were collected at the facility.

2.2 FIELD ACTIVITIES AND OBSERVATIONS

Each of the units was inspected to determine if suspect materials were present. The samples of the pipe fitting insulation from the attic were retrieved using disposable coring devices with a one-half inch diameter tube, designed such that each coring device also serves as the sampling container. Before the coring tool was inserted, the materials to be sampled were moistened to prevent asbestos fibers from becoming airborne. The coring device was placed in its outer sample container and secured by a tight fitting lid. The containers were labeled with sample numbers, and shipped to the lab. The sampling tools were wiped clean with a damp cloth and all debris resulting from the sampling activities as collected and placed into plastic bags. The small bore hole was sealed with an encapsulant.

Two samples of pipe fitting insulation were taken from the attic of each unit. The pipe run insulation is friable, as defined in the Environmental Protection Agency (EPA) regulations, meaning that it can be crushed, crumbled, pulverized, or otherwise reduced to a powder using hand pressure. Friable ACM is considered to be more hazardous than non-friable ACM since it is much more likely to release asbestos fibers. Because of its friability and instances of damage, the pipe run insulation is considered to be the most hazardous type of ACM in the Dorseyville FHU. However, its inaccessible location in the attic lessens the possibility of damage and risk to occupants.

Heating ductwork vents in the units were not sealed, so dust samples were collected by wiping the inner surface of the duct near the designated exhaust vents with a fiber-free wipe selected for its ability to trap dust in a non-fibrous matrix. Each wipe was placed in the jaws of a flexible small parts pick-up tool and moistened with fiber free water. The grille was then removed and the tool inserted into the duct opening. The interior surface was wiped to collect dust on the moistened surface of the wipe. After the dust was gathered, the wipe was placed in a small plastic wide-mouth jar, sealed, labeled with the sample number, and shipped to the lab. The grille was then replaced and the tool was cleaned by rinsing and wet wiping the surfaces prior to collecting the next sample. Samples were collected from the living room, bedroom, kitchen, and main bathroom in all three units.

Twelve colors (red, gray, gray-green, dark gray, white, black, tan, brown, dark brown, green, off-white, light gray) of 9" x 9" vinyl floor tile and green 12" x 12" vinyl floor tile were sampled. All three units contained black 9" x 9" floor tile. Units S-13 and S-19 contained red, gray, and white 9" x 9" floor tile. Unit S-13 contained green 12" x 12", gray-green 9" x 9", dark gray 9" x 9" floor tiles. Unit S-16 contained tan, brown, dark brown, and green 9" x 9" floor tile. Unit S-19 contained off-white and light gray 9" x 9" floor tile. One sample of each of the floor tile types was taken in each housing unit, resulting in a total of 18 samples for laboratory determination of asbestos content. These samples were taken by breaking off a small piece of floor tile in an inconspicuous location. About one square inch of the tile surface area was taken for each sample. No effort was made to separate the mastic, which sometimes contains asbestos, from the floor tile samples themselves.

The vinyl floor tile in all three of the units inspected was in good condition. This material is considered to be a non-friable type of ACM, unless damaged. If significant damage occurs, such that the material becomes friable as defined in the asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), the EPA would classify these tiles as friable materials. However, an EPA interpretation was recently released that changes certain previous interpretations regarding non-friable ACM. On 23 February 1990, a memorandum was issued by the Director of Emissions Standards Division, the Director of Stationary Source Compliance Division, and the Associate Enforcement Counsel for Air Enforcement of the EPA Office of Air Quality Planning and Standards (OAQPS). This memorandum was circulated to other air quality officials and EPA regional offices in early March 1990. This latest position states that floor tiles and certain other non-friable materials do not have to be removed from a facility prior to demolition, unless they are severely damaged and thus are considered friable, or unless the demolition may cause fiber release through grinding or abrasion of the tiles. Floor tile removal shall be done if demolition is to be accomplished by burning, either of the unit or of the debris from demolition. However, if the floors in the housing units are to be renovated, special care must be taken during the process to prevent the release of asbestos fibers.

The WESTON field team was directed, as a part of the project scope contained in the SAP, to perform sampling and analysis of specific suspect ACM. Other suspect material sampled was an expansion joint on the heating units. Copies of the field notes are included in Appendix A.1.

2.3 LABORATORY PROCEDURES AND RESULTS

The bulk samples of building materials were analyzed for asbestos content by WESTON's optical microscopy laboratory in Auburn, Alabama. This laboratory is accredited by the American Industrial Hygiene Association (AIHA) and the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). The bulk samples were analyzed by Polarized Light Microscopy (PLM) using the EPA's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M4-82-020, December 1982. Copies of the laboratory reports are included in Appendix A.2.

Vinyl floor tile samples for which no asbestos was found using PLM methods and wipe samples of dust accumulated within heating ductwork were analyzed qualitatively for the presence of asbestos by Transmission Electron Microscopy (TEM) at WESTON's NVLAP accredited electron microscopy laboratory in Auburn, Alabama. Copies of these laboratory reports are also included in Appendix A.2.

All analyses were performed in accordance with protocols set forth in the Laboratory Accreditation package submitted by WESTON under NVLAP. This document includes standard procedures for sample analysis and quality assurance / quality control (QA/QC) which were acceptable to NIST. The QA/QC protocols for the laboratory differ significantly from those commonly found in chemical analysis procedures, due to the nature of the analytical procedure. Since there are no reagents, digestions, or other steps in the process that provide significant opportunities for sample contamination or analyte loss, lot blanks and sample spikes are not performed. Instead, all analyses are performed using the following steps:

- Incoming samples are divided into lots of ten for analysis.
- One sample is selected at random to serve as the QC check and divided into two containers.
- The sample lot is assigned to an analyst who determines the asbestos content of each sample.
- The QC sample is analyzed by a different analyst, designated by the sample custodian.
- The results of both analysts are submitted to the QC Coordinator for review, and comparison to the laboratory QC chart.
- The results are reviewed and approved, based on the written QC review procedures, or rejected. If rejected, the sample lot and QC sample are reanalyzed.

The WESTON laboratory routinely runs blank checks to ensure that equipment and refractive index oils are not contaminated, collects and analyzes samples of the air in the work areas to document that airborne asbestos fibers do not threaten worker health or contaminate samples, and analyzes samples submitted by NIST to document precision of results as required by the NVLAP program. Samples provided in past rounds of proficiency checks are used for analyst training and to document analyst proficiency. The use of third party

laboratory comparisons is often done, and is accomplished by sending duplicates of samples to an outside laboratory and comparing the results obtained by the two facilities.

In interpreting the asbestos results, it should be noted that the definition of asbestos presence differs between the EPA and some state agencies. According to the EPA definition, any materials that contain greater than one per cent (>1%) asbestos are classified as ACM by the 1977 NESHAP regulations. However, California has recently implemented state regulations that consider all materials containing 0.1 per cent or more asbestos as asbestos-containing. It is believed that several other states will soon follow the lead of California in lowering the threshold limit to 0.1 per cent, including some in which properties under review in this study are located. Currently the State of Pennsylvania continues to abide by the EPA definition, hence, all samples containing >1% asbestos are considered to be ACM.

The matter is further complicated by the fact that the PLM method was developed specifically for friable materials, but not for non-friable types of suspect ACM such as vinyl floor tiles, vinyl sheeting, and siding. In fact, no specific method has been developed and promulgated to date for such samples, so laboratories use PLM as the only available documented procedure for their analysis. PLM has an inherent limitation on fiber resolution of about 0.25 micrometer (um) in diameter, while reliable detection and quantification of fibers smaller than 1 um in diameter is difficult. The manufacturing process for vinyl floor tiles, for example, often produces the very small fiber diameters which cannot be seen by PLM. WESTON's experience is that frequently such samples do, in fact, contain significant quantities of asbestos. WESTON has developed a qualitative technique using TEM to detect the presence of such small fibers and minimize false negatives in the laboratory results. This technique, however, does not allow a good quantitative estimate of asbestos content.

For these reasons, the WESTON laboratories have implemented a policy of reporting asbestos presence as follows:

- Asbestos determined by PLM to be present at greater than 1% is reported as the quantity detected.
- If asbestos is estimated to be less than 1% by PLM, it is reported as "<1%". This estimate of asbestos content may be made when only one asbestos structure is observed.
- If asbestos is not detected in certain non-friable materials by PLM, then the samples are subjected to TEM analysis. The results are reported as positive if asbestos is detected by TEM.

Recommendations made in this report are based on the >1% regulatory limit, except for floor tiles as discussed earlier and except as otherwise noted. However, all samples in which asbestos was detected are discussed. This represents a conservative approach to the assessment of asbestos presence at the facility.

Table 2.1 contains a summary of all samples collected at the Dorseyville FHU, including sample locations, material descriptions, and laboratory results. PLM results are quantitative while TEM results are qualitative. Quantity estimates for materials sampled that were suspected to contain asbestos are presented in Table 2.2. The field notes describing the observations are provided in Appendix A.1, while copies of the original laboratory reports are included as Appendix A.2.

TABLE 2.1
BULK SAMPLE SUMMARY
DORSEYVILLE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	ASBESTOS CONTENT PLM ANALYSIS	CONFIRMATION TEM ANALYSIS
=====				
Unit S19				

BU281-26-PA-S19-AFT	Tan 9" x 9" floor tile	Bedroom 1/Bedroom 3/ Living room	Chrysotile, 1%	
BU282-26-PA-S19-AFT	Brown 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	Chrysotile, 3%	
BU283-26-PA-S19-AFT	Black 9" x 9" floor tile	Kitchen	Chrysotile, 3%	
BU284-26-PA-S19-AFT	Dk brown 9" x 9" floor tile	All bedrooms/Hall/ Living room	Chrysotile, 2%	
BU285-26-PA-S19-ATD	Dust within ductwork	Living room	---	Positive
BU286-26-PA-S19-ATD	Dust within ductwork	Bath 2	---	Positive
BU287-26-PA-S19-ATD	Dust within ductwork	Bedroom 2	---	Positive
BU288-26-PA-S19-ATD	Dust within ductwork	Bedroom 3	---	Positive
BU289-26-PA-S19	Expansion joint	Htr room	None Detected	
BU290-26-PA-S19-AFT	Green 9" x 9" floor tile	Kitchen	Chrysotile, 2%	
BU355-26-PA-S19-API	Pipe run insulation	Attic	Chrysotile, 3%	
BU356-26-PA-S19-API	Pipe run insulation	Attic	Chrysotile, 15%	
Unit S16				

BU291-26-PA-S16-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	Chrysotile, 2%	
BU292-26-PA-S16-AFT	White 9" x 9" floor tile	Hall	Chrysotile, 1%	
BU293-26-PA-S16-AFT	Red 9" x 9" floor tile	Kitchen	Chrysotile, 2%	
BU294-26-PA-S16-AFT	Off-white 9" x 9" floor tile	Bath 1	Chrysotile, 3%	
BU295-26-PA-S16-AFT	Lt gray 9" x 9" floor tile	Bath 2	Chrysotile, 1%	
BU296-26-PA-S16-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	Chrysotile, 1%	
BU297-26-PA-S16-ATD	Dust within ductwork	Bedroom 1	---	Positive
BU298-26-PA-S16-ATD	Dust within ductwork	Bedroom 3	---	Positive
BU299-26-PA-S16-ATD	Dust within ductwork	Bath 1	---	Positive
BU300-26-PA-S16-ATD	Dust within ductwork	Living room	---	Positive
BU353-26-PA-S16-API	Pipe run insulation	Attic	Chrysotile, 1%	
BU354-26-PA-S16-API	Pipe run insulation	Attic	Chrysotile, 1%	

TABLE 2.1
BULK SAMPLE SUMMARY
DORSEYVILLE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	ASBESTOS CONTENT PLM ANALYSIS	CONFIRMATION TEM ANALYSIS
=====				
Unit S13				

BU357-26-PA-S13-AFT	Red floor tile	Kitchen	Chrysotile, 15%	
BU358-26-PA-S13-AFT	Green 12" x 12" floor tile	Kitchen	Chrysotile, 8%	
BU359-26-PA-S13-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	Chrysotile, 15%	
BU360-26-PA-S13-AFT	Gray-green 9" x 9" floor tile	Bath 1/Bath 2/Hall	Chrysotile, 10%	
BU361-26-PA-S13-AFT	Dk gray 9" x 9" floor tile	Hall	Chrysotile, 15%	
BU362-26-PA-S13-AFT	White 9" x 9" floor tile	Bath 2	Chrysotile, 3%	
BU363-26-PA-S13-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	Chrysotile, 10%	
BU364-26-PA-S13-ATD	Dust within ductwork	Kitchen	---	Negative
BU365-26-PA-S13-ATD	Dust within ductwork	Living room	---	Negative
BU366-26-PA-S13-ATD	Dust within ductwork	Bath 1	---	Positive
BU367-26-PA-S13-ATD	Dust within ductwork	Bedroom 2	---	Positive
BU368-26-PA-S13-API	Pipe run insulation	Attic	Chrysotile, 5%	
BU369-26-PA-S13-API	Pipe run insulation	Attic	Chrysotile, 5%	

TABLE 2.2
ASBESTOS CONTAINING MATERIALS
DORSEYVILLE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	QUANTITY	UNITS

Unit S19				

BU281-26-PA-S19-AFT	Tan 9" x 9" floor tile	Bedroom 1/Bedroom 3/ Living room	11	Square ft
BU282-26-PA-S19-AFT	Brown 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	800	Square ft
BU283-26-PA-S19-AFT	Black 9" x 9" floor tile	Kitchen	70	Square ft
BU284-26-PA-S19-AFT	Dk brown 9" x 9" floor tile	All bedrooms/Hall/ Living room	40	Square ft
BU285-26-PA-S19-ATD	Dust within ductwork	Living room	N/A	
BU286-26-PA-S19-ATD	Dust within ductwork	Bath 2	N/A	
BU287-26-PA-S19-ATD	Dust within ductwork	Bedroom 2	N/A	
BU288-26-PA-S19-ATD	Dust within ductwork	Bedroom 3	N/A	
BU290-26-PA-S19-AFT	Green 9" x 9" floor tile	Kitchen	5	Square ft
BU355-26-PA-S19-API	Pipe run insulation	Attic	10	Linear ft
BU356-26-PA-S19-API	Pipe run insulation	Attic	10	Linear ft
Unit S16				

BU291-26-PA-S16-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	925	Square ft
BU292-26-PA-S16-AFT	White 9" x 9" floor tile	Hall	1	Square ft
BU293-26-PA-S16-AFT	Red 9" x 9" floor tile	Kitchen	75	Square ft
BU294-26-PA-S16-AFT	Off-white 9" x 9" floor tile	Bath 1	5	Square ft
BU295-26-PA-S16-AFT	Lt gray 9" x 9" floor tile	Bath 2	5	Square ft
BU296-26-PA-S16-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	40	Square ft
BU297-26-PA-S16-ATD	Dust within ductwork	Bedroom 1	N/A	
BU298-26-PA-S16-ATD	Dust within ductwork	Bedroom 3	N/A	
BU299-26-PA-S16-ATD	Dust within ductwork	Bath 1	N/A	
BU300-26-PA-S16-ATD	Dust within ductwork	Living room	N/A	
BU353-26-PA-S16-API	Pipe run insulation	Attic	10	Linear ft
BU354-26-PA-S16-API	Pipe run insulation	Attic	10	Linear ft

TABLE 2.2
ASBESTOS CONTAINING MATERIALS
DORSEYVILLE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	QUANTITY	UNITS
=====				
Unit S13				

BU357-26-PA-S13-AFT	Red floor tile	Kitchen	82	Square ft
BU358-26-PA-S13-AFT	Green 12" x 12" floor tile	Kitchen	82	Square ft
BU359-26-PA-S13-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	893	Square ft
BU360-26-PA-S13-AFT	Gray-green 9" x 9" floor tile	Bath 1/Bath 2/Hall	8	Square ft
BU361-26-PA-S13-AFT	Dk gray 9" x 9" floor tile	Hall	1	Square ft
BU362-26-PA-S13-AFT	White 9" x 9" floor tile	Bath 2	5	Square ft
BU363-26-PA-S13-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	39	Square ft
BU366-26-PA-S13-ATD	Dust within ductwork	Bath 1	N/A	
BU367-26-PA-S13-ATD	Dust within ductwork	Bedroom 2	N/A	
BU368-26-PA-S13-API	Pipe run insulation	Attic	10	Linear ft
BU369-26-PA-S13-API	Pipe run insulation	Attic	10	Linear ft

All six samples of pipe run insulation were found to contain the chrysotile type of asbestos in a friable form at concentrations at or greater than 1% using the PLM technique for analysis. Based on these observations, the pipe run insulations should be considered to contain asbestos.

All 18 of the floor tile samples were found by PLM to contain asbestos at or greater than the 1% level. WESTON considers the 1% value reported for Sample BU-281-26-PA-S19-AFT and three additional samples which contain the same amount to be sufficient to define the samples as asbestos-containing, due to the analytical uncertainty of the PLM method when applied to floor tiles, previously discussed. The 13 units not inspected should be considered to have ACM present in the floor tiles unless additional sampling and analysis is performed and shows that no asbestos is present in these units.

Analytical results for the dust samples taken from the heater ductwork indicate that this dust contains some asbestos fibers. Qualitative TEM analyses revealed the presence of asbestos in ten of the 12 dust samples. At least two samples from each unit had detectable asbestos fibers. This data lead to the conclusion that asbestos is found in the dust trapped by the heating ducts.

No detectable asbestos fibers were found in the expansion joint sample by PLM.

2.4 CONCLUSIONS AND RECOMMENDATIONS

The sample analyses performed by WESTON have revealed that asbestos is present in most floor tile samples collected in the three housing units examined, in pipe run insulation samples, and that the dust inside the heater supply ducts contains asbestos. These units are thought to be representative of the other 13 at the site, but this was not confirmed by sampling all units.

Analytical results of the pipe run insulation confirmed that asbestos is present in all six of the samples taken. This insulation is located in the attic above the ceiling, and may be left in place as long as the attic is not used for storage and the insulation is undisturbed. If the material is left in place, an Operations and Maintenance (O&M) Plan should be developed and implemented. All of the asbestos-containing pipe run insulation must be removed prior to a planned renovation of the plumbing system or demolition of the units.

The asbestos dust accumulated within the heating ductwork represents an unusual problem, since the source of this asbestos is not readily apparent, and the quantity is not precisely known. As a conservative approach, the heating ductwork located within the concrete slab should be cleaned or permanently sealed when the units are renovated. Since the heating systems are currently operational, sealing the floor vents will require replacement with attic ducts and ceiling vents, or provisions of an alternate heating source. If the ducts are cleaned, a high-powered vacuum cleaner equipped with a high-efficiency particulate air (HEPA) filter should be employed, since other vacuum cleaners are not capable of trapping all of the small asbestos fibers that may be present.

The source of the asbestos in the ducts cannot be positively determined, due to the sampling and analysis procedures employed. However, there are several potential sources, based on observations at the numerous facilities inspected during this project. Units, presumed to be the original heaters, found at other facilities frequently contained an expansion joint which served to isolate the return air plenum from the heater itself, preventing the transmission of vibrations and noise to the ductwork. The fabric-like material used to form this joint was determined, in some cases, to be chrysotile asbestos in a nearly pure form. It is possible,

even likely, that the heating systems in these units had similar expansion joints which have been replaced. During the 25 to 30 years that the original units were in service, erosion of these joints was likely, and could have caused asbestos fibers to accumulate in the dust.

Another possibility is that residual debris from the removal of vinyl-asbestos floor tiles, such as was found in other sites, may have been left in the ducts during floor tile removal and replacement. Conversations with the TEM analysis indicate that there was some evidence of chlorine observed during the identification of the asbestos fibers by X-ray dispersion analysis in samples from some sites. The most likely source of this element, considering the site history, is the vinyl chloride polymer which forms the floor tile matrix. However, other asbestos sources, such as debris imported into the facilities from outside activities of the occupants, cannot be ruled out.

The vinyl floor tiles in the three housing units inspected were in good condition, but, should they become broken or damaged, asbestos fibers may be released. The recent EPA clarification of the definition for damaged non-friable materials apparently removes some concerns about the status of these materials at the time of renovation or demolition. Inspection of these normally non-friable materials prior to demolition is required, but, if they are in good condition at the time, they may be left in place as long as planned demolition procedures will not release a significant amount of asbestos fibers. However, if demolition will subject these non-friable materials to grinding, sanding, or abrading, or if demolition involves burning of the structure or debris from the structure, all forms of ACM, including these floor tiles, must be removed in advance.

The vinyl floor coverings should be left in place and managed under an Operations and Maintenance (O&M) plan. An O&M plan must address the following:

- The locations of all known and suspected ACM.
- The procedures and frequency for periodically assessing the ACM in the facility.
- The procedures for safely handling the ACM during maintenance or removal activities.
- Designation of an asbestos coordinator for the facility.
- The responsibilities and requirements for training of personnel involved with maintenance and renovation of the facility.
- The record-keeping program for the facility.

The vinyl floor tiles should be removed during a planned renovation of the units, in accordance with the regulations applicable at the time.

Although the expansion joint on the heating units were the only other suspect materials noted, care should be taken during renovations or demolition to identify suspect materials that may have been hidden from the view of the assessment team. The suspect materials observed by the field team, and any hidden suspect materials found later, should be analyzed for the presence of asbestos prior to being disturbed.

SECTION 3. AIRBORNE ASBESTOS ASSESSMENT

SECTION 3. AIRBORNE ASBESTOS ASSESSMENT

Sampling for airborne asbestos fibers was performed at one unit of the Dorseyville, Pennsylvania FHU on 17 April 1990 by WESTON. Dr. Leonard Nelms, a Certified Industrial Hygienist (CIH) visited the site and collected the samples using procedures described in the Asbestos Hazard Emergency Response Act (AHERA). These procedures were designed for verifying that clean-up of a contained area, following completion of an asbestos abatement action in public schools, was adequately performed. All samples were analyzed by TEM following the protocols specified in AHERA.

3.1. SAMPLING RATIONALE

WESTON followed the procedures and guidelines set forth during discussions among ANL, USATHAMA, and WESTON staff members, to provide a fast-track field sampling program and rapid analysis of samples collected. The urgency of this effort was driven by the finding that asbestos fibers were a component of the dust contained in the sub-slab ductwork of a number of the installations. The approach chosen required that the WESTON CIH collect four samples of air from selected heating registers, generally from one vent in each of the living room, kitchen, bedroom, and bathroom.

Air samples were to be collected in one unoccupied unit at the site while the heating system was operating, to simulate the worst possible case for exposure of occupants. The vacant unit selected was to be one of those from which dust within ducts had been sampled during the initial investigations, where possible. If no unit that had been sampled previously was vacant at the time, another unit was to be chosen from among those available, and samples of dust from the ducts were to be collected. These samples were to be collected after completion of sampling for airborne fibers, using the procedures employed previously. Unit S-13 was selected at the Dorseyville site, since it was vacant and had previously been sampled.

3.2. FIELD ACTIVITIES AND OBSERVATIONS

The sampling activities at this site were performed during the morning, on a cold spring day during a sleet and snow storm. The diaphragm pumps were unpacked, placed in the selected sampling locations, and turned on as soon as possible after arrival at the site to allow the mechanical components to warm up prior to checking flow rates. Since there was no floor duct in the kitchen of this unit, a sample was taken from the second bedroom instead. The heating system was turned on as soon as the pumps were in operation, to allow the air flow to stabilize, since it had not been in operation recently.

A test filter cassette, identical to those used for sample collection, was placed on the pump system being calibrated and the airflow into the filter was measured using a calibrated rotameter. This followed AHERA requirements and good industrial hygiene (IH) sampling protocols. After the pumps were calibrated, a sampling cassette made of an electrically conducting plastic was attached to the sample line, placed directly over the heating register to be sampled, and securely held in place with duct tape. The cassette contained a 25 mm diameter mixed cellulose ester (MCE) membrane filter, having a nominal pore size of 0.45 μm . The time at which sample collection was begun was recorded and the air was sampled for approximately three hours.

The pumps were operated for a length of time sufficient to draw about 1,600 liters (L) of air through each filter, based on the initial daily calibration. At the expiration of this time, the filter cassettes were removed from the heating register, inverted while the airflow continued, and lightly tapped to dislodge any fibers that may have adhered to the cowl of the cassette. Then, the cassettes were carefully removed from the sampling pump, resealed with the plugs and end caps that are a part of the cassettes, and labeled. The flow rate of each pump was again determined by exactly the same procedure used prior to the start of sample collection. After all sampling was completed, the heating system was returned to the same condition and setting that was found on entry to the unit.

The volume of air drawn through each filter was calculated, based on the average sample flow rate and the duration of sample collection, and recorded on the cassette label. Each cassette was then sealed in an anti-static plastic zipper-seal bag and placed in a shipping carton with a custom-designed anti-static foam liner. All sampling equipment, samples and other gear were then removed from the unit and the site was secured prior to departure.

Samples were collected from the four interior locations selected. In addition, a background sample of ambient outside air was taken near the entry door to the kitchen and a field blank was prepared. No significant problems were encountered during the sample collection activities.

During the sampling effort the facility was examined to identify any potential sources of asbestos that may be responsible for the asbestos fibers found in the dust. The heating system has a black-coated canvas-like expansion joint that appeared to have been installed as a replacement for an earlier joint. The present material was sampled and found to contain no asbestos, although similar materials sometimes contain asbestos. The heating ducts themselves are a fibrous material that may contain asbestos.

3.3. LABORATORY PROCEDURES AND RESULTS

Samples were shipped to the laboratory soon after collection by common carrier. The four samples of air from within the unit were analyzed by WESTON's NVLAP-accredited TEM facility, using the sample preparation and analytical procedures set forth in the EPA AHERA method. A section of the exposed filter was cut from each sample and three wedges were placed on copper wire grids for TEM mounting. The samples were etched in a plasma asher, which also destroyed some of the organic materials that may have been collected, and vacuum-coated with a thin layer of carbon, embedding the fibers that were on the filter surface. Each carbon-coated grid was placed in a Jaffe wick washer, in which the MCE filter matrix was dissolved and wicked away, leaving behind the carbon film containing any asbestos fibers collected. The grids were then examined and found to be ready for analysis.

Once the sample grids were prepared, each grid was examined by the TEM protocols of AHERA. A specified number of grid openings were scanned looking for fibers that may be asbestos. Typically, between six and ten grid openings had to be examined to comply with the detection limit of 0.005 fibers per cubic centimeter (f/cc) set forth in the regulations. Whenever a fiber was observed during this examination, the microscopist examined its morphology and determined its elemental composition from the emitted X-ray spectrum. If these indicated that it may be an asbestiform mineral, the crystal lattice structure was examined by observation of its electron diffraction pattern. The fiber was then classified either by the type of asbestos determined to be present during the analysis, or as a non-asbestos fiber.

The results for the four samples from inside Unit S-13 are presented in Table 3.1. No asbestos fibers were detected in any of these samples at a limit of detection that was between 0.003 and 0.0045 fibers per cubic centimeter (f/cc). Based on these findings, the background sample and field blank were not examined, since no asbestos fibers were detected inside the unit.

3.4 CONCLUSIONS AND RECOMMENDATIONS

The air samples collected indicate that none of the asbestos fibers from the dust found within the heating system ductwork are being released in significant quantities at this facility. No airborne asbestos fibers were found, so the concentration was lower than the detection limit and below the AHERA threshold. The limits of detection were <0.004 f/cc, which is below the acceptability limit set forth in AHERA for clearance of an abatement area in a school, and were far lower than the OSHA Permissible Exposure Limit (PEL) for workers of 0.2 f/cc.

While asbestos has been shown to pose a health risk to humans at high fiber concentrations, there are no definitive studies that indicate that a risk is associated with low-level airborne exposures such as the 0.005 f/cc AHERA limit. Therefore, sampling and analysis for airborne asbestos at this site did not reveal any health risk to the occupants of the houses, based on the TEM analyses of the samples collected. However, it is recommended by the U.S. Army Environmental Hygiene Agency (AEHA) that, if the units are to remain under the management, operational control, or ownership of the Army, additional sampling and analysis for airborne asbestos be undertaken. These studies should be performed to provide data from at least ten percent or a minimum of three of the housing units, whichever is greater. This additional sampling and analysis effort, along with the other recommended actions, will help to ensure that there is no long-term exposure risk to the occupants or to maintenance personnel.

TABLE 3.1. RESULTS OF AIRBORNE ASBESTOS SAMPLING AND ANALYSIS
DORSEYVILLE, PA FAMILY HOUSING UNITS
(ALL VALUES IN FIBERS/CC)

SAMPLE NUMBER	SAMPLE LOCATION	ASBESTOS IN DUST	ASBESTOS CONCENTRATION	ASBESTOS TYPE FOUND
S-13-LR	Living Room	NO	ND <0.004	ND
S-13-KI	Kitchen	NO	ND <0.003	ND
S-13-BR	Bedroom	YES	ND <0.004	ND
S-13-BA	Bathroom	YES	ND <0.004	ND

ND = Not Detected at the Limit of Detection Cited.

Note: The asbestos in all dust samples was chrysotile.

SECTION 4. SUMMARY OF FINDINGS

SECTION 4. SUMMARY OF FINDINGS

Sampling and analyses performed at the Dorseyville, Pennsylvania FHU reveal the presence of issues of concern from an environmental standpoint. The most significant are the detection of asbestos in 10 of the 12 dust samples, in all six pipe insulation samples, and in all of the 18 samples of floor tile.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- While the general condition of friable asbestos-containing pipe insulation is good, and it is in an inaccessible location, it can be damaged if disturbed or mishandled during maintenance activities. This material should be repaired as needed, and managed under an O&M program as long as it remains in place and undisturbed. When removal of this material and replacement with an asbestos substitute is done, trained personnel should be utilized and state and Federal regulations must be followed.
- The vinyl floor coverings pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. They should be left in place and managed under an O&M program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged.
- Additional sampling and analysis for airborne asbestos at this site is recommended by AEHA, if the units are to remain under the management, operational control, or ownership of the Army. These studies should be performed to provide data from at least ten percent or a minimum of three of the housing units, whichever is greater.

The air monitoring performed in Unit S-13 indicated that no detectable asbestos was being emitted in air from dust collected in the heating ducts. The detection limit of the method, <0.004 f/cc, is below the AHERA limit and well below the OSHA PEL of 0.2 f/cc.

APPENDIX A.1. FIELD DATA, ASBESTOS SAMPLING

0781

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Durseyville Family Housing, Unit 519
 FACILITY CONTACT Sandy Ricketts TELEPHONE NUMBER (412) 777-1231
 TECHNICIAN NAME Michael Kelly SIGNATURE Michael T Kelly
 TECHNICIAN NAME Rolf Erga SIGNATURE Rolf Erga
 TIME ARRIVED 1420 TIME DEPARTED 1500 DATE 01 Mar 90
 dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit is a three bedroom, Capehart style house with wood shingles on outside walls and the shingles on roof. Inside has vinyl flooring and plaster board walls and ceiling. There is no insulation on any of the pipe runs observed. There is no transite on the outside of the unit, either. There is a sixth expansion joint in furnace duct (this material sampled). The units surveyed at Durseyville were selected by Sandy Ricketts, Housing Manager, based on the availability of the occupants. Some units were selected because they were vacant. Mrs Ricketts assured me that the units selected were a representative sample of all the Durseyville units. Five floor tiles and four dust samples were taken. Also, expansion joint in Htr Rm was sampled. Attic contained blown-in insulation (not sampled). The areas for the closets are included within with the areas for the rooms in which the closets occur. This unit is currently vacant. Returned to Unit 519 at 2137, 01 March 1990, to check attic for pipe.

ACTIVITY CHECKLIST

Interviews Completed	<u>No</u>	Number of Samples	<u>4</u> <u>12</u> MCS
Drawings Reviewed	<u>No</u>	Survey Form Completed	<u>Yes</u>
Drawings Attached	<u>Yes</u>	Site Log Completed	<u>Yes</u>
Visual Inspection	<u>Yes</u>	Chain-of-Custody Initiated	<u>Yes</u>
Number of Photos	<u>2</u> MCS	Exp. Assess. Form Init.	<u>Yes</u>
Q.A. Check ☒	SIGNATURE <u>Michael Skomicki</u>	DATE <u>21 MAR/90</u>	dd mm yy

SITE SURVEY LOG

(Continued)

Run insulation: Two pipes are covered by gray rock-type insulation. Pipes are 4" in diameter. Left at 0730.

ASBESTOS SURVEY DATA

073

BLDG. NO.: 151119

INSTALLATION 101216

TASK TEAM MEMBERS

Michael Kordley

Rolf Erga

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL

BLDG. NAME: Dreyfus Family Housing, Unit 519

DATE (dd/mm/yy): 01/03/90

BLDG. DESCRIPTION: Cap-n-hat

TIME ARRIVED: 1220

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B1012811	-210	-FIA	-S114	-A1F1T	LIVING ROOM	1111	-	111111B	01
2.	B1012812	-210	-FIA	-S114	-A1F1T	HALL	1810	-	111111C	01
3.	B1012813	-210	-FIA	-S114	-A1F1T	KITCHEN	1170	-	111111D	01
4.	B1012814	-210	-FIA	-S114	-A1F1T	BEDROOM 1	1170	-	111111E	01
5.	B1012815	-210	-FIA	-S114	-A1T1D	LIVING ROOM	1111	-	111111F	01
6.	B1012816	-210	-FIA	-S114	-A1T1D	BATH 1	1111	-	111111G	01
7.	B1012817	-210	-FIA	-S114	-A1T1D	BEDROOM 2	1111	-	111111H	01
8.	B1012818	-210	-FIA	-S114	-A1T1D	BEDROOM 3	1111	-	111111I	01
9.	B1012819	-210	-FIA	-S114	-A11	KITCHEN	1111	-	111111J	01
10.	B1012820	-210	-FIA	-S114	-A1F1T	KITCHEN	1115	-	111111K	01
11.	B101315	-210	-FIA	-S114	-A1F1T	KITCHEN	1110	-	111111L	01
12.	B101316	-210	-FIA	-S114	-A1F1T	KITCHEN	1110	-	111111M	01

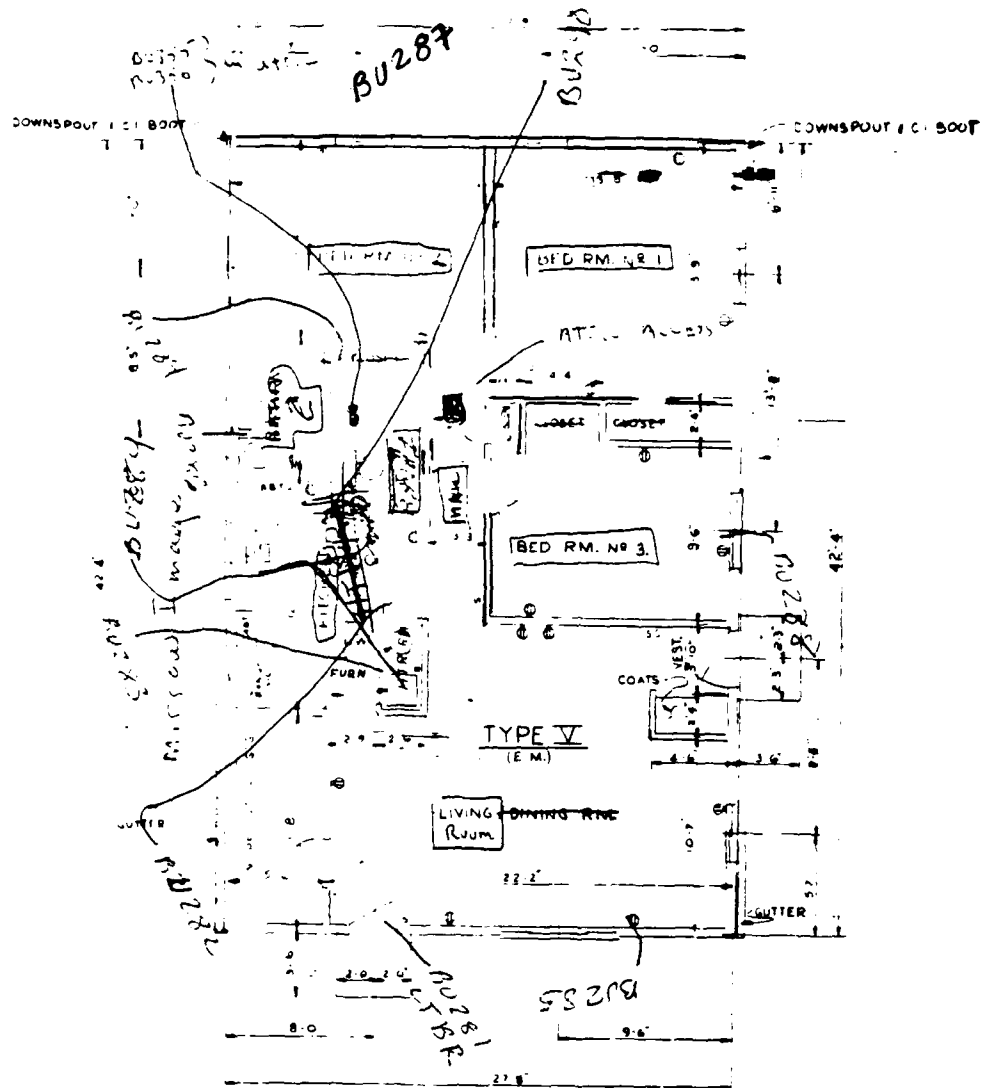
NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Tan 9" x 9" floor tile. Also in Bedroom 3 and Bedroom 1
02	Brown 9" x 9" floor tile. Also in Living Room, Bedroom 3, Bath 1, Bedroom 1, Bedroom 2, Bath 2.
03	Black 9" x 9" floor tile
04	Dark brown 9" x 9" floor tile. Also in Living Room, Bedroom 3, Bedroom 1 and Hall. Only in closets in these rooms
05	Dust in duct work. No vent in Kitchen.
06	Expansion joint in furnace duct. Cloth. Quantity = each.
07	Green 9" x 9" floor tile.
08	Gray, arcell-type insulation on two pipe runs in attic. Pipes are probably hot water lines less than 7" in diameter.

TECHNICIAN SIGNATURE

Michael Kordley

QUALITY ASSURANCE SIGNATURE

Michael Skotnicki



Unit S-19 Dorseyville, PA
 (This is a mirror image of actual building)

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Dorseyville Family Housing, Unit 516
 FACILITY CONTACT Sandy Ricketts TELEPHONE NUMBER (412) 777-1231
 TECHNICIAN NAME Michael Kordley SIGNATURE Michael Kordley
 TECHNICIAN NAME Ralf Erga SIGNATURE Ralf Erga
 TIME ARRIVED 1503 TIME DEPARTED 1533 DATE 01 Mar 90
 dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit 516 is a three bedroom Capehart-style house with wooden shingles on outside walls and for shingles on roof. Inside covered by vinyl flooring with plaster board walls and ceilings. All pipes observed were bare of insulation. There is an expansion joint in the furnace duct similar to the one in Unit 519. There are no transoms shingles on building.
 Six floor tiles and four ducts were sampled. This unit is currently vacant.
 The areas for the closets are included with the areas for the rooms in which the closets occur.

Returned to this unit at 0910, 05 March 1990, to check attic for pipe runs. Gray arcell-type insulationⁱⁿ pipes runs in attic. There are two runs. These runs are covered by blown-in insulation and are impossible to see without digging through insulation. Left 516 at 1135.

ACTIVITY CHECKLIST

Interviews Completed	<u>No</u>	Number of Samples	<u>12</u>
Drawings Reviewed	<u>No</u>	Survey Form Completed	<u>Yes</u>
Drawings Attached	<u>Yes</u>	Site Log Completed	<u>Yes</u>
Visual Inspection	<u>Yes</u>	Chain-of-Custody Initiated	<u>Yes</u>
Number of Photos	<u>2</u>	Exp. Assess. Form Init.	<u>Yes</u>
Q.A. Check ☒	SIGNATURE <u>Michael Skotnicki</u>	DATE <u>21 MAR/90</u>	dd mm yy

0787

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

DATE (dd/mm/yy): 01/05/90

TIME ARRIVED: 1 5 6 3

ITEM NO.	LAB SAMPLE NO.				AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
		BASE NO.	STATE	UNIT NO.					
1.	BV024911-26-FA-S116-AFIT				MALE	145	-	115718	011
2.	BV024912-26-FA-S116-AFIT				MALE	111	-	115718	012
3.	BV024913-26-FA-S116-AFIT				MULTIUMIN	175	-	115718	013
4.	BV024914-26-PA-S116-AFIT				GINTH	115	-	115718	014
5.	BV024915-26-PA-S116-AFIT				BIRITH	115	-	115718	015
6.	BV024916-26-PA-S116-AFIT				BIEGIRUIM 12	170	-	115718	016
7.	BV024917-26-FA-S116-AITC				BIEGIRUIM	111	-	111	017
8.	BV024918-26-PA-S116-AITC				BIEGIRUIM 13	111	-	111	018
9.	BV024919-26-PA-S116-AITC				BIRITH	111	-	111	019
10.	BV024920-26-PA-S116-AITC				MULTIUMIN 12	111	-	111	020
11.	1111-1-1-1-1-A11				RITHIRIM	111	-	115718	021
12.	BV024921-26-PA-S116-AFIE				AITITH	110	Y	115718	022
13.	BV024922-26-PA-S116-API				ATTIC	10	Y	115718	023

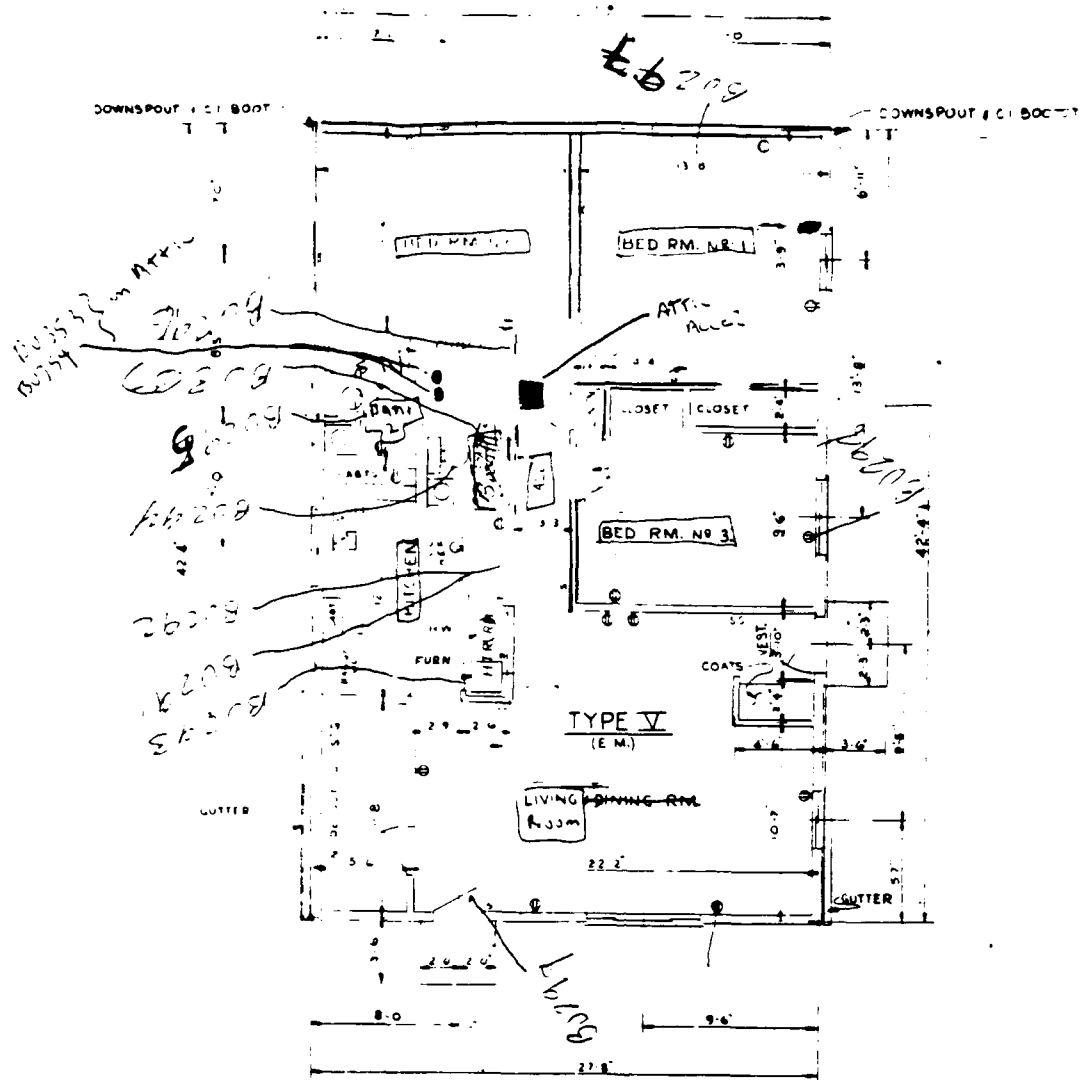
NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Gray 9" x 9" floor tile. Also in Living Room, Bedroom 1, Bedroom 2, Bedroom 3, Bath 1, and Bath 2.
02	White 9" x 9" floor tile
03	Red 9" x 9" floor tile
04	Off-white 9" x 9" floor tile
05	Light gray 9" x 9" floor tile
06	Black 9" x 9" floor tile. Bedroom 1, Bedroom 3, Hall, and Living Room (in closets)
07	Dust in ductwork. No vent in Living Room ⁱⁿ Kitchen.
08	Expansion joint on furnace duct. Same as in Unit 519. Not sampled
09	Airwell-type pipe run insulation. Probably hot water pipes. Covered by blown-in insulation. Less than 4' in diameter. Quantity in living room.

TECHNICIAN
SIGNATURE

Michael Kelley

QUALITY ASSURANCE
SIGNATURE

Michael Skotnicki



Unit S-16 Dorseyville, PA
(This is a mirror image of actual building.)

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Dorseyville Family Housing Unit S13
 FACILITY CONTACT Sandy Brubaker TELEPHONE NUMBER (412) 777-1231
 TECHNICIAN NAME Michael Skolnick SIGNATURE Michael Skolnick
 TECHNICIAN NAME Rolf Ergas SIGNATURE Rolf Ergas
 TIME ARRIVED 0755 TIME DEPARTED 1045 DATE 05 Mar 90
 dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit S13 is a three bedroom Capehart-style house with wooden shingles on outside walls and the shingles on roof. Inside floors are covered by vinyl flooring, walls and ceiling are plasterboard. All pipes below attic are basic insulation. There is an expansion joint similar to that one sampled in S17. Not sampled in Unit S13. There are no transite shingles on outside walls. The unit sits on a concrete pad.

The areas for the closets are included with the area for the rooms in which the closets occur.

The unit is currently vacant of occupants.

Two pipes run in the attic are covered by a gray wickell-type insulation. These are probably hot water lines feeding the baths. The pipes are under blown-in insulation and can't be seen without digging through the blown-in material.

Seven floor tile samples, two pipe run samples, and four dust samples taken.

ACTIVITY CHECKLIST

Interviews Completed	<u>No</u>	Number of Samples	<u>15</u> 13
Drawings Reviewed	<u>No</u>	Survey Form Completed	<u>Yes</u>
Drawings Attached	<u>Yes</u>	Site Log Completed	<u>Yes</u>
Visual Inspection	<u>Yes</u>	Chain-of-Custody Initiated	<u>Yes</u>
Number of Photos	<u>2</u>	Exp. Assess. Form Init.	<u>Yes</u>
Q.A. Check ☒	SIGNATURE <u>Michael Skolnick</u>	DATE <u>21 MAR 90</u>	dd mm yy

ASBESTOS SURVEY DATA

0791

BLDG. NO.: S 1113

INSTALLATION 01210

TASK TEAM MEMBERS

Michael Kindley

Rolf Erga

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Duquoyville Family Housing, Unit 513

DATE (dd/mm/yy): 05/07/90

BLDG. DESCRIPTION: Cupboard

TIME ARRIVED: 0155

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B10131017-210-PIA-S1113-AFIT					KILTINGHEIM	1182	-	11131018	01
2.	B10131018-210-PIA-S1113-AFIT					KILTINGHEIM	1182	-	11131019	02
3.	B10131019-210-PIA-S1113-AFIT					HALLWAY	1183	-	11131020	03
4.	B10131020-210-PIA-S1113-AFIT					BATHROOM	1118	-	11131021	04
5.	B10131021-210-PIA-S1113-AFIT					HALLWAY	1111	-	11131022	05
6.	B10131022-210-PIA-S1113-AFIT					BATHROOM	1115	-	11131023	06
7.	B10131023-210-PIA-S1113-AFIT					BEDROOM	1131	-	11131024	07
8.	B10131024-210-PIA-S1113-AFIT					KILTINGHEIM	1111	-	1111	08
9.	B10131025-210-PIA-S1113-AFIT					LIVING ROOM	1111	-	1111	09
10.	B10131026-210-PIA-S1113-AFIT					BATHROOM	1111	-	1111	10
11.	B10131027-210-PIA-S1113-AFIT					BEDROOM	1111	-	1111	11
12.	B10131028-210-PIA-S1113-AFIT					BATHROOM	1110	-	11131029	12
13.	B10131029-210-PIA-S1113-AFIT					ATTIC	110	-	11131030	13

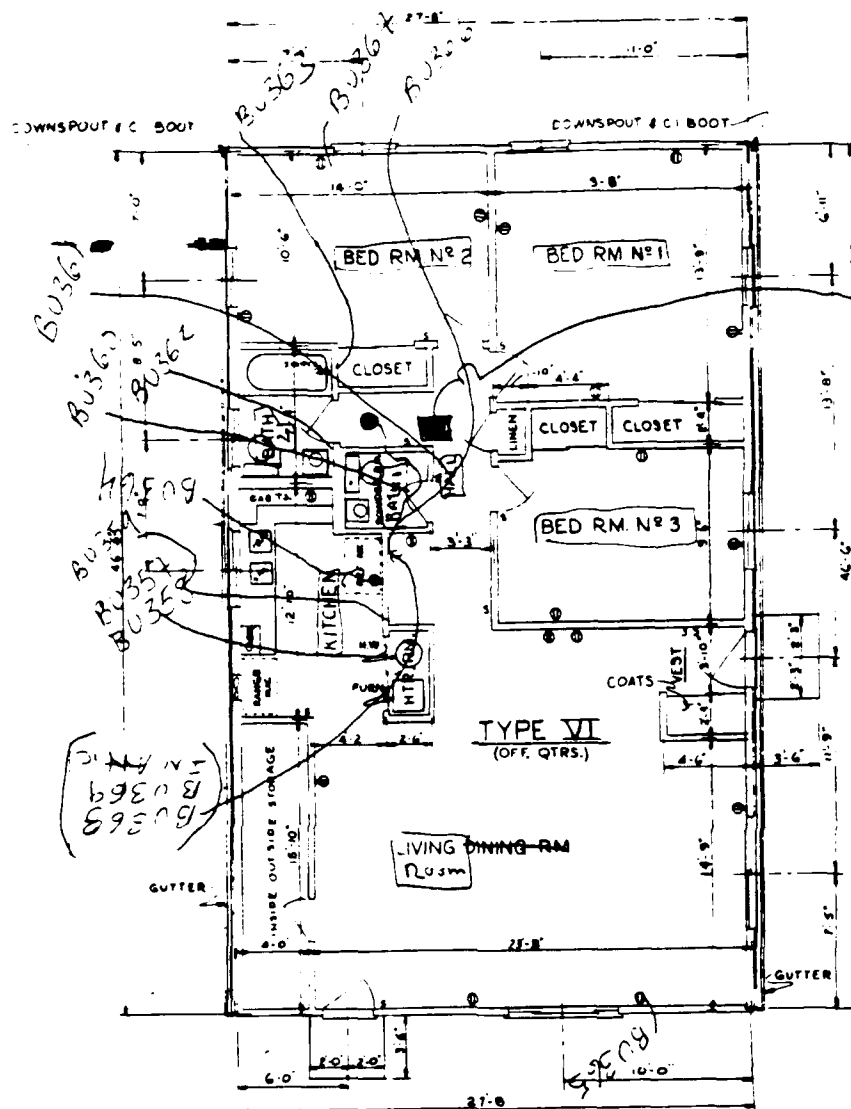
NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Red floor tile. Less under green 12 x 12 floor tile
02	Green 12 x 12 floor tile
03	Gray 9" x 9" floor tile. Also occurs in Living Room, Bath 1, Bath 2, Bedroom 1, Bedroom 2, Bedroom 3
04	Gray-green 9" x 9" floor tile. Also in Hall and Bath 2
05	Dark gray 9" x 9" floor tile
06	White 9" x 9" floor tile
07	Black 9" x 9" floor tile. Also in Living Room, Hall, Bedroom 1, and Bedroom 3 (covered in asbestos)
08	Dust in dustwork
09	Two pipe lines covered by a gray, micell-type insulation. Pipes are hidden from view by blown-in insulation.
10	Expansion joint similar to the one in Unit 519 noted in this unit also

TECHNICIAN
SIGNATURE

Michael Kindley

QUALITY ASSURANCE
SIGNATURE

Michael Skotnicki



APPENDIX A.2. LABORATORY DATA, ASBESTOS SAMPLES

BULK SAMPLE ANALYSIS SUMMARY

Weston W.O. No. 2104-13-01-0000

Sample Number BU281 through Sample BU296

AO LAB ID NO	CLIENT/CLIENT ID	LOCATION	MATERIAL DESCRIPTION *	DATE RECEIVED	RESULTS **					LAYERS	ANALYST
					CH	AM	CR	OT	TL		
BU281	26-PA-S19-AFT	LIV RM	NF, TN, 9X9 FT	03/06/90	1	ND	ND	ND	1	No	06806
BU282	26-PA-S19-AFT	HALL	NF, BR, 9X9 FT	03/06/90	3	ND	ND	ND	3	No	06806
BU283	26-PA-S19-AFT	KIT	NF, BK, 9X9 FT	03/06/90	3	ND	ND	ND	3	No	06806
BU284	26-PA-S19-AFT	BEDRM2	NF, BR, 9X9 FT	03/06/90	2	ND	ND	ND	2	No	06806
BU289	26-PA-S19-A	HTR RM	F, EXPAN JT	03/06/90	ND	ND	ND	ND	ND	No	06806
BU290	26-PA-S19-AFT	KIT	NF, GR, 9X9 FT	03/06/90	2	ND	ND	ND	2	No	06806
BU291	26-PA-S16-AFT	HALL	NF, GY, 9X9 FT	03/06/90	2	ND	ND	ND	2	No	06806
BU292	26-PA-S16-AFT	HALL	NF, WH, 9X9 FT	03/06/90	1	ND	ND	ND	1	No	06806
BU293	26-PA-S16-AFT	KIT	NF, RD, 9X9 FT	03/06/90	2	ND	ND	ND	2	No	06806
BU294	26-PA-S16-AFT	BATH 1	NF, WH, 9X9 FT	03/06/90	3	ND	ND	ND	3	No	06806
BU295	26-PA-S16-AFT	BATH 2	NF, GY, 9X9 FT	03/06/90	1	ND	ND	ND	1	No	06806
BU296	26-PA-S16-AFT	BEDRM2	NF, BK, 9X9 FT	03/06/90	1	ND	ND	ND	1	No	06806
BU353	26-PA-S16-API	ATTIC	F, PIPE INSUL	03/07/90	1	ND	ND	ND	1	Yes	07323
BU354	26-PA-S16-API	ATTIC	F, PIPE INSUL	03/07/90	1	ND	ND	ND	1	Yes	07323
BU355	26-PA-S19-API	ATTIC	F, GY, PIPE INSUL	03/07/90	3	ND	ND	ND	3	Yes	07323
BU356	26-PA-S19-API	ATTIC	F, GY, PIPE INSUL	03/07/90	15	ND	ND	ND	15	Yes	07323
BU357	26-PA-S13-AFT	KIT	NF, RD, 12X12 FT	03/07/90	15	ND	ND	ND	15	Yes	07323
BU358	26-PA-S13-AFT	KIT	NF, GR, 12X12 FT	03/07/90	8	ND	ND	ND	8	No	07323
BU359	26-PA-S13-AFT	HALL	NF, GY, 9X9 FT	03/07/90	15	ND	ND	ND	15	Yes	07323
BU360	26-PA-S13-AFT	BATH 1	NF, GY, 9X9 FT	03/07/90	10	ND	ND	ND	10	Yes	07323
BU361	26-PA-S13-AFT	HALL	NF, GY, 9X9 FT	03/07/90	15	ND	ND	ND	15	Yes	07323
BU362	26-PA-S13-AFT	BATH 2	NF, WH, 9X9 FT	03/07/90	3	ND	ND	ND	3	No	06072
BU363	26-PA-S13-AFT	BEDRM2	NF, BK, 9X9 FT	03/07/90	10	ND	ND	ND	10	No	06072
BU368	26-PA-S13-API	ATTIC	F, GY, PIPE INSUL	03/07/90	5	ND	ND	ND	5	Yes	06072
BU369	26-PA-S13-API	ATTIC	F, GY, PIPE INSUL	03/07/90	5	ND	ND	ND	5	Yes	06072

* MATERIAL DESCRIPTION		FRIABLE ¹	COLOR ²		SYSTEM ³
Friable ¹ , Color ² , System ³ , Type		F - Friable NF - Non-Friable	BK - Black BL - Blue BR - Brown GR - Green GY - Gray	RD - Red TN - Tan WH - White YL - Yellow	CHW - Chilled Water DOM - Domestic Water HHW - Heating Hot Water STM - Steam UNK - Unknown
** RESULTS					
CH - Chrysotile	OT - Other				
AM - Amosite	TL - Total				
CR - Crocidolite					

Upon issue, this report may be reproduced only in full.

All analyses are performed in accordance with the methods set forth in U.S. EPA 600/M4-82-020, as amended. Weston's Optical Microscopy Laboratory is accredited by the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program for asbestos fiber analysis (Laboratory Code 1254).



ROY F. WESTON, INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
PHONE: (205) 826-6100
FAX: (205) 826-8232

Transmission Electron Microscopy
Asbestos Summary Report

Client: Argonne National Laboratories Weston W.O. No.: 2104-13-01-0000

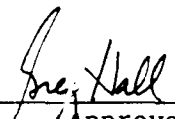
Sample Type: Dust Sampling Location: Dorseyville

QUALITATIVE ANALYSIS

DUST WIPE SAMPLES: A generous loading of dust was collected on a pre-wetted, 25 square centimeter section of a cleanroom wipe. The wipe was placed in a two ounce wide mouth collection vial and returned to the laboratory. Ten to fifteen milliliters of filtered, deionized water was added to suspend the dust. The suspension was ultrasonically dispersed and the coarse fraction was allowed to settle. A drop of the suspension was placed on a Formvar coated 200 mesh Cu TEM grid and allowed to dry. The grid was carbon coated as above and examined by transmission electron microscopy at 120 kilovolts accelerating voltage.

ANALYTICAL RESULTS

<u>SAMPLE IDENTIFICATION</u>	<u>RESULTS</u>
BU285-26-PA-S19-ATD	Positive
BU286-26-PA-S19-ATD	Positive
BU287-26-PA-S19-ATD	Positive
BU288-26-PA-S19-ATD	Positive
BU297-26-PA-S16-ATD	Positive
BU298-26-PA-S16-ATD	Positive
BU299-26-PA-S16-ATD	Positive
BU300-26-PA-S16-ATD	Positive
BU364-26-PA-S13-ATD	Negative
BU365-26-PA-S13-ATD	Negative
BU366-26-PA-S13-ATD	Positive
BU367-26-PA-S13-ATD	Positive


(Approved for Transmittal)

3/28/90
(Date)

- * This test report relates only to the specific items tested.
- ** These sample results may only be reproduced in full, and are valid only if approved for transmittal.

B.1 FIELD DATA AIRBORNE ASBESTOS SAMPLING

**FIELD NOTES FOR DORSEYVILLE
UNIT S-13
17 APRIL 1990**

This FHU is a three-bedroom unit with what appears to be plywood siding on the exterior, a typical Capehart construction of slab-on-grade. The unit is covered with 9"x9" floor tile virtually throughout. This floor tile in the living room, dining area, hallway, the three bedrooms, and the two baths is a tan mottled style, which has been patched extensively. In the bathroom there are approximately six pieces of white with black mottling 9"x9" tiles plus approximately 12 pieces of a different tan colored mottled tile. Several pieces of the same tan tile are located in the hallway and in the half-bath off the hall. The tiles in this area near the half-bath and in the half-bath itself are broken and are somewhat deteriorated. The bedroom and hall closets, with the exception of the laundry room, throughout the facility are covered with black 9"x9" floor tiles. The large closet off the kitchen at the rear of the home has a painted concrete slab with no floor covering. The kitchen itself is covered with an olive green 12"x12" floor tile with a pattern in it. The heating unit is contained in a mechanical room at the kitchen and has a black canvas-like expansion joint unlike that at Finleyville. No rough edge of this expansion joint could be located to investigate its composition. Sampling could not have been performed of this material without causing significant damage to the expansion joint. No other suspect asbestos-containing materials were noted anywhere on this property. The duct exhaust air sampling was performed in the living room, in the duct on the end wall at the front of the home; in the kitchen, in a duct next to the mechanical room, which is the only floor vent in the kitchen; in the full bath, at the only duct in that room; and in the bedroom at the left rear corner of the house, in the vent at the end wall. The outside sample was collected from the front left bedroom just outside the window. At the beginning of the sampling period, rain mixed with sleet and snow was falling. Winds were generally west but fairly light. By the end of the sampling period, precipitation had ceased and the skies were less cloudy and less threatening. No significant problems were encountered during the sampling at the Dorseyville site. The Rural Ridge site was sampled concurrently with the Dorseyville site.

AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Dorseyville Unit S-13
 WORK AREA ID NO. _____ SAMPLE NO. S-13-LR

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Living Room Vent

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 99

PUMP Cal Initial

7

9.8

9.0

Mean Flow

PUMP Cal Final

8

8.2

1650

Sample Vol (VA)

0858

12:01

183

Time Began

Time End

Sample Time

L. NELMS

17 Apr '90

Technician

Date

ANALYTICAL DATA

ANALYST _____

Scope 10

Microscopic Field Area (MFA)

mm²

Date/Time Mounted

Date/Time Counted

Total Fibers Counted

Total Fields Counted

Average Count

f/fld

Blank Count

f/fld

Blank Corrected Count (BCC)

Fiber Density

f/mm²

Detection Limit (DL)

f/cc

Concentration (C)

f/cc

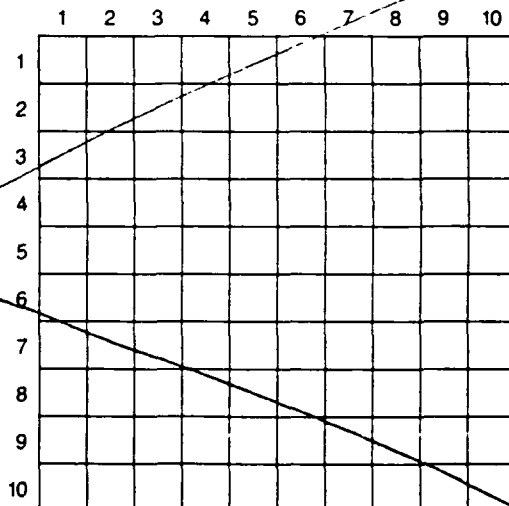
$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

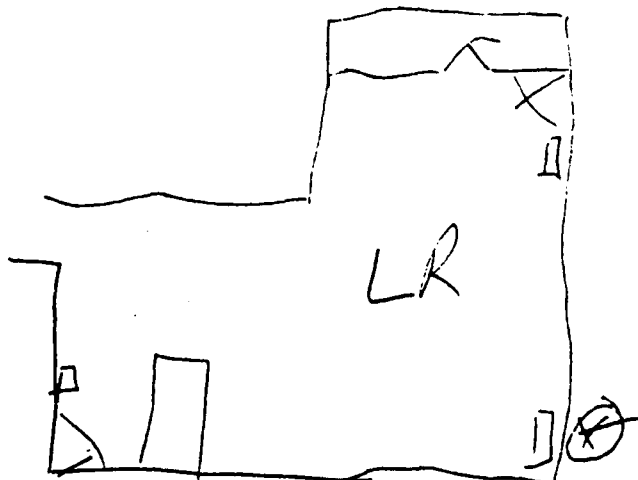
Signature _____

Date _____



NOTES/SKETCHES REMARKS

TEM



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Darseyville Unit 5-13
 WORK AREA ID NO. _____ SAMPLE NO. S-13-KI

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Kitchen Vent

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 97

PUMP Cal Initial 7 10.2 10.1 L/min

PUMP Cal Final 8 10.0 1830 L/min
no. rate rate Sample Vol. (VA)

0902 12:03
Time Began Time End

181 min
Sample Time

L. Nelms
Technician

17 Apr '90
Date

ANALYTICAL DATA

ANALYST _____

Scope ID _____

Date/Time Mounted _____

Total Fibers Counted _____

Average Count 170

Blank Corrected Count (BCC) _____

Detection Limit (DL) 1/cc

Microscopic Field Area (MFA) mm² _____

Date/Time Counted _____

Total Fields Counted _____

Blank Count _____

Fiber Density 17/mm²

Concentration (C) 1/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

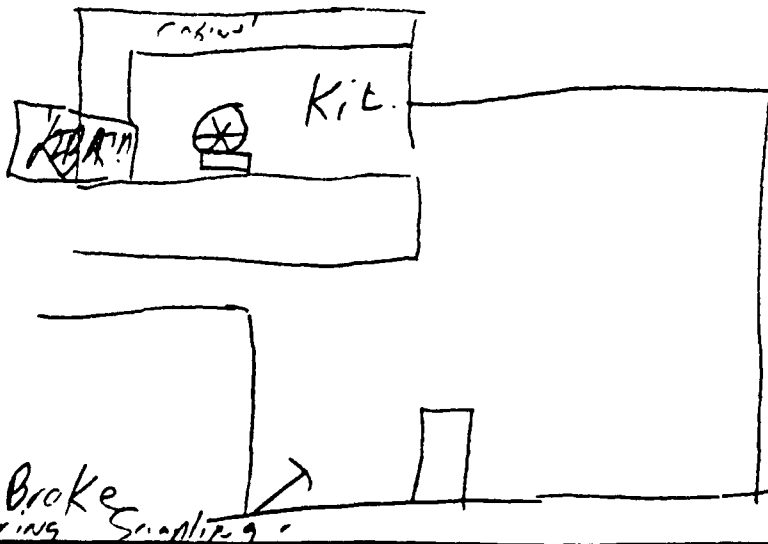
Signature _____

Date _____

	1	2	3	4	5	6	7	8	9	10
1										
2										
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7										
8										
9										
10										

NOTES/SKETCHES REMARKS

TEM



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Dorseyville Unit S-13
 WORK AREA ID NO. _____ SAMPLE NO. S-13 BR

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Bedroom Vent

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL, REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE

(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 70

PUMP Cal Initial 7 9.8 9.8 L/min
no. rate Mean Flow

PUMP Cal Final 8 9.8 1560
no. rate Sample Vol. (VA)

0901 1140 137
0850 Time Began Time End Sample Time min
L. Nelms 17 April '90
Technician Date

ANALYTICAL DATA

ANALYST _____

Scope ID _____

Date/Time Mounted _____

Total Fibers Counted _____

Average Count 1/fld

Blank Corrected Count (BCC) _____

Detection Limit (DL) 1/cc

Microscopic Field Area (MFA) mm²

Date/Time Counted _____

Total Fields Counted _____

Blank Count 1/fld

Fiber Density 1/mm²

Concentration (C) 1/cc

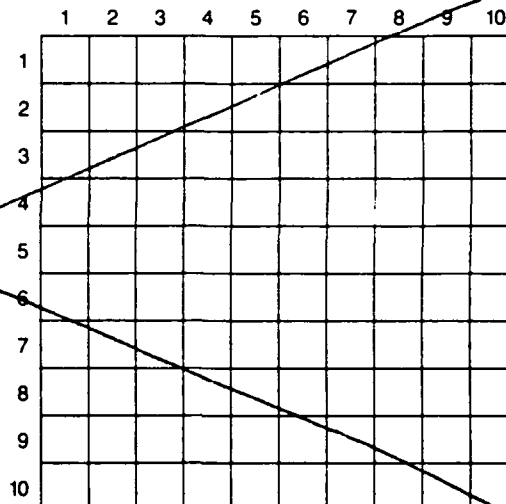
$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

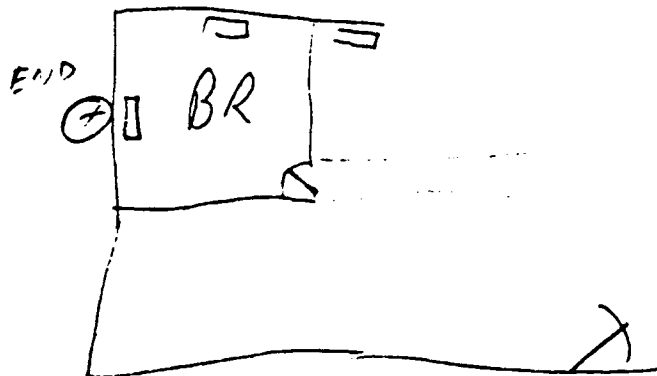
Signature _____

Date _____



NOTES/SKETCHES REMARKS

TEM



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Dorseyville Unit S-13
 WORK AREA ID NO. _____ SAMPLE NO. S-13-BA

SAMPLE TYPE

- ☐ PERSONNEL
 NAME _____
 TASK _____
- ☒ AMBIENT
☐ WORK AREA
☐ ADJACENT ROOM
☐ BACKGROUND
☒ OTHER Bathroom Vent
- ☐ CLEARANCE
☐ INITIAL
☐ FINAL, REOCCUPANCY
☐ OTHER _____
☐ TWA SAMPLE
 (SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 80

PUMP Cal Initial 7 9.8 9.5 L/min
 no. rate Mean Flow

PUMP Cal Final 8 9.2 1720
 no. rate Sample Vol. (VA)

0859 12:00 181 min
 Time Began Time End Sample Time
L. Nelms 17 Apr '90
 technician Date

ANALYTICAL DATA

ANALYST _____

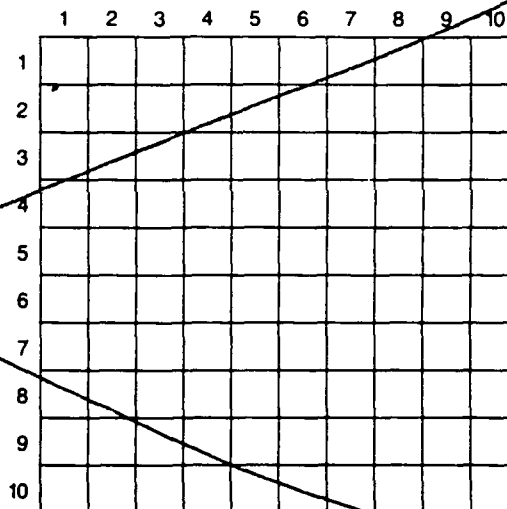
Scope ID _____ Microscopic Field Area (MFA) _____ mm²
 Date/Time Mounted _____ Date/Time Counted _____
 Total Fibers Counted _____ Total Fields Counted _____
 Average Count _____ f/ld Blank Count _____ f/ld
 Blank Corrected Count (BCC) _____ Fiber Density _____ f/mm²
 Detection Limit (DL) _____ f/cc Concentration (C) _____ f/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

Signature _____ Date _____



NOTES/SKETCHES REMARKS

TEM

AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Dorseyville Unit S-13
 WORK AREA ID NO. _____ SAMPLE NO. S-13-04T

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☒ BACKGROUND

☐ OTHER _____

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 78

PUMP Cal Initial 7 8.5 8.4 L/min
no. rate Mean Flow

PUMP Cal Final 8 8.2 1690
no. rate Sample Vol. (VA)

0845 1207 202 min
Time Began Time End Sample Time

L. Nelms 17 Apr '90
Technician Date

ANALYTICAL DATA

ANALYST _____

Scope ID. _____ Microscopic Field Area (MFA) mm²

Date/Time Mounted _____ Date/Time Counted _____

Total Fibers Counted _____ Total Fields Counted _____

Average Count f/ld Blank Count f/ld

Blank Corrected Count (BCC) f/cc Fiber Density f/mm²

Detection Limit (DL) f/cc Concentration (C) f/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

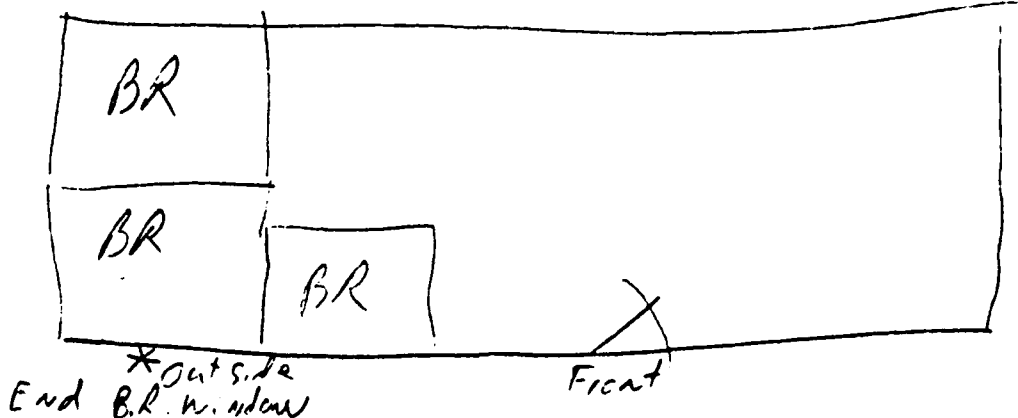
Signature _____

Date _____

1	2	3	4	5	6	7	8	9	10
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

NOTES/SKETCHES REMARKS

TEM



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Dorseyville Unit S-13
 WORK AREA ID NO. _____ SAMPLE NO. S-13-FB

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER

☐ CLEAN ROOM

☐ AFD EXHAUST

Field Blank

☐ CLEARANCE

☐ INITIAL

☐ FINAL, REOCCUPANCY

☐ OTHER

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. None

PUMP Cal Initial N/A rate _____ L/min

PUMP Cal Final N/A rate _____ Sample Vol. (VA) _____

0844 1208 224 min
 Time Began Time End Sample Time

L. Nelms 17 Apr.
 Technician Date

ANALYTICAL DATA

ANALYST _____

Scope ID _____

Date/Time Mounted _____

Total Fibers Counted _____

Average Count _____ f/field

Blank Corrected Count (BCC) _____

Detection Limit (DL) _____ f/cc

Microscopic Field Area (MFA) _____ mm²

Date/Time Counted _____

Total Fields Counted _____

Blank Count _____ f/field

Fiber Density _____ f/mm²

Concentration (C) _____ f/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

Signature _____

Date _____

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

NOTES/SKETCHES REMARKS

TEM

B.2 LABORATORY DATA AIRBORNE ASBESTOS SAMPLING



ROY F. WESTON, INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
PHONE: (205) 826-6100
FAX: (205) 826-8232

TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S13-LR

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE910

Received by: Beth Hiltbold
Analyzed by: Barry Rayfield

Date Received: 04/18/90
Date Analyzed: 04/20/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1650.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 7
Total Area Examined: 0.0616 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0224-D-4,5

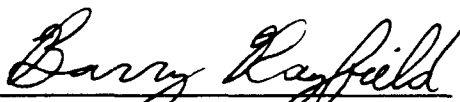
ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		<u>Ambiguous</u>	<u>Non-Asbestos</u>
	<u><5μm</u>	<u>$\geq$5μm</u>	<u><5μm</u>	<u>$\geq$5μm</u>		
Number of Fibers Analyzed:	0	0	0	0	0	0
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

This test report relates only to the specific items tested.



ROY F. WESTON, INC.
1635 PUMPHREY AVE.
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PHONE: (205) 826-6100
FAX: (205) 826-8232

TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S13-KI

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE909

Received by: Beth Hiltbold
Analyzed by: Barry Rayfield

Date Received: 04/18/90
Date Analyzed: 04/20/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1830.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 7
Total Area Examined: 0.0616 mm²
Detection Limit: 0.003 fibers/cc
Grid Archive No.: 0224-D-2,3

ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		Ambiguous	Non-Asbestos
	<5 μ m	$\geq$ 5 μ m	<5 μ m	$\geq$ 5 μ m		
Number of Fibers Analyzed:	0	0	0	0	0	0
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

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TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S13-BR

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE906

Received by: Beth Hiltbold
Analyzed by: Greg Hall

Date Received: 04/18/90
Date Analyzed: 04/20/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1560.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 7
Total Area Examined: 0.0616 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0224-B-2,3

ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		<u>Ambiguous</u>	<u>Non-Asbestos</u>
	<u><5μm</u>	<u>$\geq$5μm</u>	<u><5μm</u>	<u>$\geq$5μm</u>		
Number of Fibers Analyzed:	0	0	0	0	0	0
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

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TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S13-BA

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE907

Received by: Beth Hiltbold
Analyzed by: Greg Hall

Date Received: 04/18/90
Date Analyzed: 04/20/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1720.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 7
Total Area Examined: 0.0616 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0224-B-5,C-1

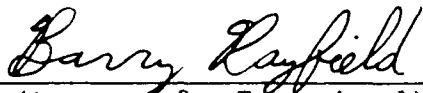
ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		<u>Ambiguous</u>	<u>Non-Asbestos</u>
	<u><5μm</u>	<u>$\geq$5μm</u>	<u><5μm</u>	<u>$\geq$5μm</u>		
Number of Fibers Analyzed:	0	0	0	0	0	0
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

This test report relates only to the specific items tested.