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ASBESTOS CONTAINING MATERIAL RE-INSPECTION BUILDING 35 VOLUME 7 CNC  
CHARLESTON SC  
2/15/2000  
BAT ASSOCIATES, INC.

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**Volume 7**

**Asbestos-Containing Material Re-inspection  
For Building 35  
Charleston Naval Shipyard  
Charleston, South Carolina**

Contract No. N2467-96-D-0998  
Delivery Order No. 0013

*Prepared for:*

Department of the Navy  
Southern Division  
NAVFACENGCOM  
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February 15, 2000

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BAT recommends the following management actions for the identified ACM in Building 35 in Table 2.0.

**Table 2.0**  
**Recommended Response Actions**

<b>HA No.</b>	<b>Material Description</b>	<b>Recommended Response Action</b>
1	Floor Tile, 9" x 9" black w/ black mastic	Remove prior to renovation or demolition
4	Floor Tile, 12" x 12" brown with light and dark streaks w/ black mastic	Remove prior to renovation or demolition
6	Floor Tile, 12" x 12" off-white with brown streaks w/ black mastic	Remove prior to renovation or demolition
7	Floor Tile, 12" x 12" off-white with beige streaks w/ black mastic	Remove prior to renovation or demolition
17	Pipe Fitting Insulation, 3" with canvas wrap on domestic water	Remove prior to renovation or demolition
18	Pipe Fitting Insulation, 3" with canvas wrap on	Remove prior to renovation or demolition
22	Pipe Insulation, 12" with metal wrap	Remove prior to renovation or demolition

Other suspect ACM not identified could be present in areas of the building inaccessible to the asbestos building inspectors. For example, materials could exist in walls and other locations where access could only be gained by demolition of the building. Also, other materials currently not recognized by the asbestos building inspection industry could exist.

The total estimated cost for the removal of the identified and/or assumed ACM in Building 35 is approximately \$129,500. See Section 10.0 for a break down of the preliminary cost estimate for the removal of the identified or assumed ACM.

## 2.0 BUILDING INSPECTION INFORMATION FORM

**Building Name:** Barracks  
**Building Number:** 35  
**Facility:** Charleston Naval Shipyard  
**Building Area (square footage):** 35,880  
**Year Built:** 1959  
**Building Type:** Living Quarters  
**No. of Floors in Building:** Three  
**Purpose of ACM Survey:** Re-Inspection  
**Facility Unit Identification Code (UIC):** N/A

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**Building Contact:** Mr. Matthew Humphrey  
**Contact's Telephone No.:** (843) 743-9985  
**Building Survey Date(s):** November 23, 1999 and January 28, 2000

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**Asbestos Inspector's Name:** Mr. Jason McGlashan and Mr. Foshie Bell  
**Asbestos Inspector's Accreditation No:** GA2900  
**Inspection Company:** BAT Associates, Inc.  
**Company Telephone No.** (770) 242-3908

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### 3.0 INTRODUCTION

BAT Associates, Inc. (BAT) was retained by the U.S. Department of the Navy, Southern Division (SouthDiv), Naval Facilities Engineering Command (NAVFACENGCOM) to perform an asbestos-containing material (ACM) re-inspection of all buildings located at the Charleston Naval Shipyard in Charleston, South Carolina. The purpose of this re-inspection was to:

1. Perform a comprehensive ACM re-inspection of 34 buildings in accordance with Federal and U.S. Navy requirements;
2. Assess the condition of previously identified friable and non-friable ACM; and
3. Provide a preliminary cost estimate for the removal of identified ACM.

The re-inspection was performed in accordance with the Navy's Asbestos Facility Inventory/Assessment Protocol (NEESA 70.2-010) and the U.S. Environmental Protection Agency's (USEPA) Asbestos Hazard Emergency Response Act (AHERA) and the Asbestos School Hazard Abatement Reauthorization Act (ASHARA).

The results of the re-inspection survey are presented in 24 separate volume reports. This report describes the results for Building 35.

This re-inspection survey was performed by Mr. Jason McGlashan and Mr. Foshie Bell, under the direct supervision of Mr. Douglas J. Milton, CIH, on November 23, 1999 and January 28, 2000. Mr. McGlashan is an accredited building inspector. Mr. Bell is an accredited asbestos building inspector and management planner. Mr. Milton, a Certified Industrial Hygienist, is an accredited asbestos inspector, management planner, and project designer.

This report discusses the sampling methodology used during the re-inspection and assessment (Section 4.0); a list of all identified suspect materials (Section 5.0); a summary of the bulk sample analysis results (Section 6.0); results of quality control sampling; (Section 7.0); physical assessments of the identified ACM (Section 8.0); a hazard assessment of the identified ACM (Section 9.0); preliminary cost estimates for removal (Section 10.0); and conclusions (Section 11.0). Appendix A contains drawings identifying the location of collected bulk samples and the locations of identified ACM. Appendix B contains photographic documentation of identified ACM. Appendix C contains personnel and laboratory accreditations. Appendix D contains laboratory analysis results.

The assessment protocol for ACM involved three distinct steps:

1. Performed preliminary walk-through of the building to identify suspect ACM and to determine the amount of suspect ACM, to define the number of samples to be collected, to identify access problems (e.g., collection of samples in a limited access pipe chase below the building), and to determine the degree of personal protection necessary for the bulk sample collection.

2. Visually inspected the building for ACM to identify the location of the suspect ACM and to determine if the material was friable or non-friable. Suspect materials were then categorized according to the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) for asbestos as: Category I non-friable materials, Category II non-friable materials, and Regulated (friable) Asbestos-Containing Materials (RACM).
3. Collected bulk samples for the analysis for asbestos content (see Section 4.0, *Sampling Methodology*, for details).

#### 4.0 SAMPLE METHODOLOGY

Representative, randomly selected bulk samples were collected in accordance with the Navy's and AHERA sampling protocol, as described in 40 CFR 353.35, and in accordance with BAT's contract requirements. Bulk samples were collected from homogenous areas (materials) in a manner that minimized any release of airborne asbestos fibers. A homogeneous area (material) is defined as a material uniform in size, color and texture.

The minimum number of samples collected from each homogeneous area was as follows:

1. *Friable Spray-Applied or Trowel-Applied Material (including plaster)*
  - a. Less than or equal to 1,000 Square Feet (S.F.) = 3 samples
  - b. Greater than 1,000 S.F and less than or equal to 5,000 S.F. = 5 samples
  - c. Greater than 5,000 = 7 samples
2. *Pipe and Duct Insulation*
  - a. Three samples per homogeneous area of insulation.
3. *Elbows, Valves, Fittings, and Connection Mud*

Three representative samples from each type of insulated elbow, valve, fitting, and connection mud.
4. *Boiler, Tanks, and Furnaces*

A minimum of 3 samples per unit.
5. *Patchwork*

Patchwork is defined as a patch or repair to existing material based on the following quantities:

- a. Surfacing material patches are limited to a maximum of 6 S.F.
- b. Pipe and duct insulation patches are limited to a maximum of 6 Linear Feet (L.F.) or 6 S.F.
- c. Boiler, tank, and furnace patches are limited to 6 S.F.

If the patchwork exceeded the limits prescribed above, it was sampled according to the homogeneous area protocol in items 1 to 4 above. If a material qualifies as patchwork, a single sample was collected per patch.

6. *Ceiling or Acoustical Tile*

3 samples

7. *Miscellaneous Friable Material*

3 samples

8. *Non-Friable Material*

Non-friable materials for purpose of this survey included Transite-type panels, floor tiles, floor tile mastic, and other miscellaneous materials.

Minimum of 3 samples.

The procedures followed for collection of each bulk sample is outlined briefly below:

1. The accredited inspector collecting the sample was equipped with the appropriate personal protective equipment. This included a half-mask air-purifying respirator, protective gloves and protective eyewear.
2. The surface of the material being sampled was wetted with amended water (containing a surfactant to aid penetration) mist to lessen the risk of fiber release during sampling.
3. Each sample was extracted using the appropriate equipment, (e.g., a sample container, knife, core borer). Care was taken to insure that all layers of the suspect materials, down to the substrate, were included in the sample.
4. Each sample was placed in an individual container, which was then sealed and labeled with a unique identification number which was also recorded on the sample data log-in sheet.

5. After each sample was collected, the area immediately surrounding the sampling location was inspected for debris and wet-cleaned as necessary to lessen the risk of an airborne fiber release.
6. All necessary data were recorded on the BAT Suspect Material Inventory Form including sample number, sample location, type of suspect material, name of inspector collecting the sample and other relevant information.
7. Samples were then transported to Cape Environmental Management Inc. (CAPE) Asbestos Laboratories in Atlanta, Georgia, for Polarized Light Microscopy (PLM) analysis. The CAPE Asbestos Laboratory participates in the National Voluntary Laboratory Assurance Program (NVLAP) for the analysis of asbestos content in suspect materials. CAPE's NVLAP Laboratory Code is 102111-0.
8. BAT collected duplicate samples during the collection of primary bulk sampling for quality control (QC) purposes. QC samples were collected at ten percent of the bulk sample locations. They were assigned unrelated sample identification numbers and analyzed by Analytical Environmental Services, Inc. (AES). AES participates in the National Voluntary Laboratory Assurance Program (NVLAP) for the analysis of asbestos content in suspect materials. AES's NVLAP Laboratory Code is 102033-0.
9. Upon receipt by the laboratory, the samples were logged in and assigned a unique laboratory identification number. The laboratory analyzed the samples in accordance with 40 CFR 353.87 subpart F. Copies of the laboratory accreditations for both laboratories may be found in Appendix C.

## 5.0 ASBESTOS INVENTORY AND ASSESSMENT

Table 3.0 describes the suspect ACM identified in and around Building 35.

**Table 3.0**  
**Summary of Identified Suspect ACM**

HA No.	Description of Suspect ACM	Location of Suspect ACM	AHERA Category of Material
1	Floor Tile, 9" x 9" black w/ black mastic	Throughout the building, below HA # 2, 3, 4, 6, and 7	Misc.
2	Floor Tile, 12" x 12" off-white with gray and beige speckles w/ black mastic	Third floor, corridor (over HA # 1)	N/A
3	Floor Tile, 12" x 12" blue with white streaks w/ black mastic	Third floor, corridor (over HA # 1) and janitor closet	N/A
4	Floor Tile, 12" x 12" off-white with beige and brown speckles w/ black mastic	Third floor, rooms (over HA # 1)	Misc.
5	Floor Tile, 12" x 12" aqua with green streaks w/ brown mastic	First floor, day room	N/A
6	Floor Tile, 12" x 12" off-white with beige streaks w/ black mastic	First floor, main lobby and office; second floor, all rooms except restrooms and stairwells (over HA # 1)	Misc.
7	Floor Tile, 12" x 12" off-white with beige and brown streaks w/ black mastic	First floor, east and west wing rooms, corridor and day room (over HA # 1)	Misc.
8	Floor Tile, 12" x 12" beige with brown speckles w/ black mastic	First floor, janitor closet	N/A
9	Floor Tile, 12" x 12" red w/ black mastic	Second floor, janitor closet	N/A
10	Sheet Flooring, yellow and brown w/ black mastic	First floor, day room	N/A
11	Drywall, on walls	Throughout the building	N/A
12	Joint Sealer Compound, on drywall	Throughout the building	N/A
13	Ceiling Tile, 2' x 4' white suspended groove and pinhole (old)	First floor, day room	N/A
14	Ceiling Tile, 2' x 4' white suspended groove and pinhole (new)	First floor, day room	N/A
15	Spray-Applied Textured Ceiling Finish	Third floor, restrooms	N/A
17	Pipe Fitting Insulation, 3" with canvas wrap on domestic water	All floors, in walls behind all water fixtures	TSI
18	Pipe Fitting Insulation, 3" with canvas wrap on steam	Piping to all wall mounted radiators	TSI
19	Window Glazing, interior	All interior windows	N/A
20	Roofing, built-up	Roof	N/A
22	Pipe Insulation, 12" with metal wrap	In crawl space and between buildings 35 and 36	TSI
23	Tank Insulation	In exterior mechanical room	N/A

HA No.	Description of Suspect ACM	Location of Suspect ACM	AHERA Category of Material
24	Mastic on Sink, black	Second floor, writing room	N/A

**Notes:** Misc. = Miscellaneous Material      N/A = Not Applicable

## 6.0 SUMMARY OF SAMPLE ANALYSIS RESULTS

Table 4.0 contains a summary of the bulk sample analysis results for suspect ACM identified in this building. Sample identification numbers do not necessarily match the building number since barracks 31, 32, 33, 34, 35, and 36 are of similar construction, have the same square footage, and the same construction date and were inspected as one unit.

All thermal system insulation (TSI), if present, was classified as friable material. As long as the outer covering remains intact and is in good condition the TSI can be considered non-friable (29 CFR 353.85). Ceiling tile, if asbestos is present was considered a friable material. However, if non-friable materials are drilled, sawed, ground or otherwise physically or mechanically disturbed, they may release asbestos fibers to the environment and therefore would be considered a friable material.

According to AHERA protocol, all samples within a homogeneous area must have an asbestos content of one percent or less by weight using Polarized Light Microscopy (PLM) analysis before the material can be categorized as non-asbestos-containing. If one sample is determined as asbestos-containing using PLM analysis, the entire homogeneous area must be classified asbestos-containing.

**Table 4.0**  
**Summary of Sample Analysis Results**

HA No.	Sample ID No.	Suspect Material Description	Asbestos Content	Friability
1	31-5-1	Floor Tile, 9" x 9" black w/ black mastic	Tile = 7% chrysotile, Mastic = 2% chrysotile	Non
2	32-2-1, 32-2-2, 32-2-3	Floor Tile, 12" x 12" off-white with gray streaks w/ black mastic	Tile = NAD, Mastic = NAD	N/A
3	33-4-1, 33-4-2, 33-4-3	Floor Tile, 12" x 12" dark blue with white streaks w/ black mastic	Tile = NAD, Mastic = NAD	N/A
4	33-5-1	Floor Tile, 12" x 12" brown with light and dark streaks w/ black mastic	Tile = 3% chrysotile, Mastic = 10% chrysotile	Non
5	35-5-1, 35-5-2, 35-5-3	Floor Tile, 12" x 12" aqua with green streaks w/ brown mastic	Tile = NAD, Mastic = NAD	N/A
6	31-2-1	Floor Tile, 12" x 12" off-white with brown streaks w/ black mastic	Tile = 10% chrysotile, Mastic = 1-2% chrysotile	Non
7	34-3-1, 34-3-2	Floor Tile, 12" x 12" off-white with beige streaks w/ black mastic	Tile = 5% chrysotile, Mastic = 5% chrysotile	Non
8	34-10-1, 34-10-2, 34-10-3	Floor Tile, 12" x 12" beige with brown streaks w/ black mastic	Tile = NAD, Mastic = NAD	N/A

HA No.	Sample ID No.	Suspect Material Description	Asbestos Content	Friability
9	32-6-1, 32-6-2, 32-6-3	Floor Tile, 12"x 12" red w/ black mastic	Tile = NAD, Mastic = 3% chrysotile	Non
10	35-10-1, 35-10-2, 35-10-3	Sheet Flooring, yellow and brown w/ black mastic	NAD	N/A
11	31-10-1, 31-10-2, 31-10-3	Drywall, on walls	NAD	N/A
12	31-11-1, 31-11-2, 31-11-3	Joint Sealer Compound, on drywall	NAD	N/A
13	31-6-1, 31-6-2, 31-6-3	Ceiling Tile, 2' x 4' white suspended groove and pinhole (old)	NAD	N/A
14	31-7-1, 31-7-2, 31-7-3	Ceiling Tile, 2' x 4' white suspended groove and pinhole (new)	NAD	N/A
15	33-11-1, 33-11-2, 33-11-3	Spray-Applied Textured Ceiling Finish	NAD	N/A
17	Assume	Pipe Fitting Insulation, 3" with canvas wrap on domestic water	Assumed to contain asbestos due to inaccessibility of the material in walls	Friable
18	33-3-1, 33-3-2, 33-3-3	Pipe Fitting Insulation, 3" with canvas wrap on steam	15-20% chrysotile, 15-20% amosite	Friable
19	36-4-1, 36-4-2, 36-4-3	Window Glazing, interior	NAD	N/A
20	36-15-1, 36-15-2, 36-15-3	Roofing, built-up	NAD	N/A
22	Exterior Pipe-32	Pipe Insulation, 12" with metal wrap	Layer 1 = 155 amosite, Layer 2 = NAD	Friable
23	B35-S1, B35-S2, B35-S3	Tank Insulation	NAD	N/A
24	35-24-1, 35-24-2, 35-24-3	Mastic on Sink, black	NAD	N/A

**Notes:** NAD = No Asbestos Detected N/A = Not Applicable

**7.0 RESULTS OF QUALITY CONTROL SAMPLING**

The purpose of quality control (QC) sampling was to ensure reproducibility of the primary laboratory analysis results. Duplicate samples were collected for ten percent of the total building samples for QC purposes.

Quality control sampling and analysis was performed for buildings 31, 32, 33, 34, and 36.

No discrepancies between primary laboratory and quality control laboratory bulk sample analysis were noted.

## 8.0 PHYSICAL ASSESSMENT OF IDENTIFIED ACM

The following sections contain a summary of the methodology BAT specialists used to conduct the physical assessment for this building. This methodology was developed in accordance with USEPA AHERA re-inspection requirements contained in 40 CFR Part 353.85.

### 1. Physical Assessment for Friable ACM.

A. **Condition.** Friable ACM were assigned to one of the following categories based on a visual inspection and touch test:

1) **Significantly Damaged Condition.** Material which met one or both of the following characteristics:

- a. Ten percent (10%) or more of the material in the functional space is crumbled, blistered, or is hanging from the surface, deteriorated, showing adhesive failure, water stained, gouged or marred, and the damage is evenly distributed.
- b. Twenty-five percent (25%) or more of the material in the functional space is crumbled, blistered, or is hanging from the surface, deteriorated, showing adhesive failure, water stained, gouged or marred, and the damage is localized.

2) **Damaged Condition.** Material which met one or both of the following characteristics:

- a. The surface is crumbling, blistered, water stained, gouged or marred, or otherwise damaged on less than ten percent (10%) of the material in the functional space (but material is too damaged to be characterized as good condition) and the damage is evenly distributed.
- a. The surface is crumbling, blistered, water stained, gouged or marred, or otherwise damaged on twenty-five percent (25%) or more of the material in the functional space (but material is too damaged to be characterized as good condition) and the damage is localized.

3) **Good Condition.** Material with very limited, or no visible damage or deterioration.

B. **Potential for Disturbance.** Friable ACM were assigned to one of the following categories based on a visual inspection and assessment of surroundings:

- 1) **Potential for Significant Damage.** Material which met one or more of the following conditions:
  - a. High potential for Contact. Service workers are in the vicinity of the material more than once each week or the material is in a public area and is accessible to building occupants.
  - b. High Potential for Vibration. Loud motors or engines present in the vicinity of the material or there are intrusive noises or easily sensed vibrations from surrounding area, such as nearby highways or airports.
  - c. High Potential for Air Erosion. High velocity air moving across or against material.
  
- 2) **Potential for Damage.** Material which met one or more of the following conditions for potential for significant damage:
  - a. Moderate Potential for Contact. Service workers are in the vicinity of the material at least once each month, but less than once each week or the material is in a room or office and is accessible to the occupants.
  - b. Moderate Potential for Vibration. Motors or engines present but not obtrusive or occasional loud noise in the vicinity of the material.
  - c. Moderate potential for Air Erosion. Noticeable movement of air across or against material, but not high in velocity.
  
- 3) **Low Potential for Damage.** Material which met one or more of the following conditions and met none of the conditions for potential for significant damage or potential for damage:
  - a. Low Potential for Contact. Service workers are in the vicinity of the material less than once each month or the material is visible but not accessible to the building occupants in the course of normal activity.
  - b. Low Potential for Vibration. None of the conditions for high or moderate potential for vibration are met.
  - c. Low Potential for Air Erosion. None of the conditions for high or moderate potential for air erosion are met.

## 2. Physical Assessment for Thermal ACM.

A. **Condition.** Thermal ACMs were assigned to one of the following categories based on a visual inspection:

1) **Significantly Damaged Condition.** Material which met one or both of the following characteristics:

- a. Missing jackets, crushed, heavily gouged, or punctured insulation on equal to or greater than ten percent (10%) of the material in the functional space, and the damage is evenly distributed.
- b. Missing jackets, crushed, heavily gouged, or punctured insulation on equal to or greater than twenty-five percent (25%) of the material in the functional space, and the damage is localized.

2) **Damaged Condition.** Material which met one or both of the following characteristics:

- a. Missing jackets, crushed, heavily gouged, or punctured insulation on less than ten percent (10%) of the material in the functional space, and the damage is evenly distributed.
- b. Missing jackets, crushed, heavily gouged, or punctured insulation on greater than twenty-five percent (25%) of the material in the functional space, and the damage is localized.

3) **Good Condition.** Material with very limited, or no visible damage or deterioration.

B. **Potential for Disturbance.** Thermal ACMs were assigned to one of the following categories based on a visual inspection and assessment of surroundings:

1) **Potential for Significant Damage.** Material which met one or more of the following conditions:

- a. **High Potential for Contact.** Service workers are in the vicinity of the material more than once each week or the material is in a public area and is accessible to building occupants.
- b. **High Potential for Vibration.** Loud motors or engines present in the vicinity of the material or there are intrusive noises or easily sensed vibrations from surrounding area, such as a nearby highway or airport.

- c. **High Potential for Air Erosion.** High velocity air moving across or against the material.
- 2) **Potential for Damage.** Material which met one or more of the following conditions and met none of the conditions for potential for significant damage.
- a. **Moderate Potential for Contact.** Service workers are in the vicinity of the material at least once each month but less than once each week or the material is in a room or office and is accessible to the occupants.
  - b. **Moderate Potential for Vibration.** Motors or engines present but not obtrusive or occasional loud noise in the vicinity of the material.
  - c. **Moderate Potential for Air Erosion.** Noticeable movement of air across or against material, but not high in velocity.
- 3) **Low Potential for Damage.** Material which met one or more of the following conditions and met none of the conditions for potential for significant damage or potential for damage:
- a. **Low Potential for Contact.** Service workers are in the vicinity of the material less than once per month or the material is visible but not accessible to the building occupants in the course of normal activity.
  - b. **Low Potential for Vibration.** None of the conditions for high or moderate potential for vibration are met.
  - c. **Low Potential for Air Erosion.** None of the conditions for high or moderate potential for air erosion are met.









**PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** Assumed to contain asbestos

**HOMOGENEOUS AREA No.:** 17

**TYPE OF MATERIAL:** Surfacing  TSI  Other

**Description:** Pipe Fitting Insulation, 3" white with canvas wrap on domestic water

**Approximate Amount of Asbestos-Containing Material (Linear or Square Foot):** 375 EA

**CONDITION:**

**Percent Damage:** UNK % Damage Localized Distributed

**Type of Damage:** Deterioration Water Physical

**DESCRIPTION:**

**Overall Rating:** UNK Good Fair Poor

**POTENTIAL FOR DISTURBANCE:**

**Frequency of Potential Contact:** High Moderate  Low

**Description:** Material is located in walls.

**Influence of Vibration:** High Moderate  Low

**Description:** None identified.

**Potential for Air Erosion:** High Moderate  Low

**Description:** None identified.

**OVERALL RATING:** Potential for Significant Damage Potential for Damage  Low Potential for Damage

**COMMENTS:** Material should be removed prior to renovation or demolition.

**PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** 33-3-1, 33-3-2, and 33-3-3

**HOMOGENEOUS AREA No.:** 18

**TYPE OF MATERIAL:** Surfacing  TSI  Other

Description: Pipe Fitting Insulation, 3" with canvas wrap on steam

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 300 EA

**CONDITION:**

Percent Damage: <1 % Damage Localized Distributed

Type of Damage: Deterioration Water Physical

**DESCRIPTION:**

Overall Rating:  Good Fair Poor

**POTENTIAL FOR DISTURBANCE:**

Frequency of Potential Contact: High  Moderate Low

Description: Material is located near the walls.

Influence of Vibration: High Moderate  Low

Description: None identified.

Potential for Air Erosion: High Moderate  Low

Description: None identified.

**OVERALL RATING:** Potential for Significant Damage  Potential for Damage Low Potential for Damage

**COMMENTS:** Material should be removed prior to renovation or demolition.

**PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** Exterior pipe-32

**HOMOGENEOUS AREA No.:** 22

**TYPE OF MATERIAL:** Surfacing  TSI  Other

Description: Pipe Insulation, 12" with metal wrap

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 160 LF

**CONDITION:**

Percent Damage: 10 % Damage Localized  Distributed

Type of Damage:  Deterioration Water Physical

**DESCRIPTION:**

Overall Rating: Good  Fair  Poor

**POTENTIAL FOR DISTURBANCE:**

Frequency of Potential Contact: High Moderate  Low

Description: Majority of material is located above head level.

Influence of Vibration: High Moderate  Low

Description: None identified.

Potential for Air Erosion: High Moderate  Low

Description: None identified.

**OVERALL RATING:** Potential for Significant Damage  Potential for Damage  Low Potential for Damage

**COMMENTS:** Material should be removed prior to renovation or demolition.

## 9.0 HAZARD ASSESSMENT OF IDENTIFIED ACM

AHERA describes a hazard assessment as "the means of collecting and considering whatever data were necessary for the management planner to make an informed, responsible recommendation to the LEA [Local Education Agency] consistent with response action requirements". As stated in AHERA, there is no single assessment method that is required in the regulations.

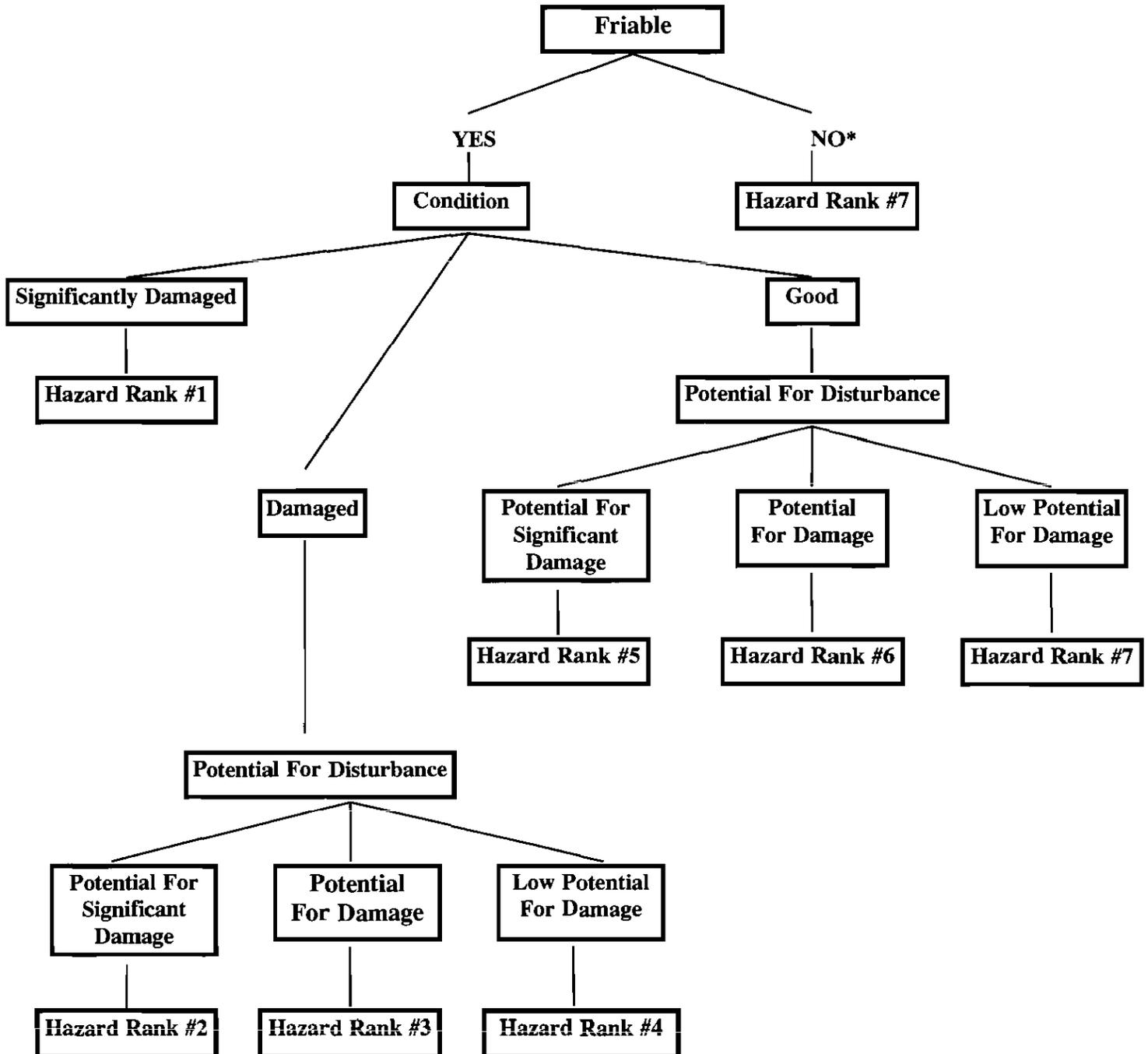
BAT adopted for this re-inspection one of the four general classes of hazard assessment models considered during the AHERA rule-making process. This method for hazard assessment is a modified decision tree as detailed in the USEPA, *Guidance for Assessing and Managing Exposure to Asbestos in Buildings*, or the *Pink Book*. Based on the physical assessment responses documented in the field, the BAT Management Planner proceeded through the decision tree process depicted in Figure 1.0 on the following page.

Only the identified and/or assumed asbestos-containing materials were assessed for hazards.

All of the identified and/or assumed asbestos-containing materials observed in this building were in good condition on the day of the survey.

**Figure 1.0 Decision Tree Diagram For Hazard Assessment**

Hazard rank #1 are materials of highest concern, and hazard rank #7 are the materials least likely to release asbestos fibers to the work area.



\*Miscellaneous materials that are considered non-friable were placed in the Hazard Rank #8 category, which is in good condition with a low potential for damage.





**HAZARD ASSESSMENT AND RESPONSE ACTION DATA  
FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** 31-2-1

**HOMOGENEOUS AREA No.:** 6

**TYPE OF MATERIAL:** Surfacing TSI  Other

Description: Floor Tile, 12" x 12" off-white with brown streaks w/ black mastic

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 7,420 SF

Approximate Recommended Response Action Cost:

**HAZARD ASSESSMENT**

**RESPONSE ACTION RECOMMENDATION**

- |  |   |
|--|---|
| (1) Significantly damaged                                      | <input checked="" type="checkbox"/> (1) Removal |
| (2) Damaged plus potential for significant damage              | (2) Encapsulation                               |
| (3) Damaged plus potential for damage                          | (3) Enclosure                                   |
| (4) Damaged plus low potential for damage                      | (4) Repair                                      |
| (5) ACM (good condition) with potential for significant damage | (5) Operations and Maintenance Program          |
| (6) ACM (good condition) with potential for damage             |   |
| (7) Any remaining friable ACM or friable suspect ACM           |   |
| <input checked="" type="checkbox"/> (8) Non-friable ACM        |   |

**COMMENTS:** Material should be removed prior to renovation or demolition.

**HAZARD ASSESSMENT AND RESPONSE ACTION DATA  
FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** 34-3-1 and 34-3-2

**HOMOGENEOUS AREA No.:** 7

**TYPE OF MATERIAL:** Surfacing TSI  Other

**Description:** Floor Tile, 12" x 12" off-white with beige streaks w/ black mastic

**Approximate Amount of Asbestos-Containing Material (Linear or Square Foot):** 7,140 SF

**Approximate Recommended Response Action Cost:**

**HAZARD ASSESSMENT**

**RESPONSE ACTION RECOMMENDATION**

- |  |   |
|--|---|
| (1) Significantly damaged                                      | <input checked="" type="checkbox"/> (1) Removal |
| (2) Damaged plus potential for significant damage              | (2) Encapsulation                               |
| (3) Damaged plus potential for damage                          | (3) Enclosure                                   |
| (4) Damaged plus low potential for damage                      | (4) Repair                                      |
| (5) ACM (good condition) with potential for significant damage | (5) Operations and Maintenance Program          |
| (6) ACM (good condition) with potential for damage             |   |
| (7) Any remaining friable ACM or friable suspect ACM           |   |
| <input checked="" type="checkbox"/> (8) Non-friable ACM        |   |

**COMMENTS:** Material should be removed prior to renovation or demolition.

**HAZARD ASSESSMENT AND RESPONSE ACTION DATA  
FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** Assumed to contain asbestos

**HOMOGENEOUS AREA No.:** 17

**TYPE OF MATERIAL:** Surfacing  TSI Other

**Description:** Pipe Fitting Insulation, 3" with canvas wrap on domestic water

**Approximate Amount of Asbestos-Containing Material (Linear or Square Foot):** 375 EA

**Approximate Recommended Response Action Cost:**

**HAZARD ASSESSMENT**

**RESPONSE ACTION RECOMMENDATION**

- |   |   |
|---|---|
| (1) Significantly damaged   | <input checked="" type="checkbox"/> (1) Removal |
| (2) Damaged plus potential for significant damage                             | (2) Encapsulation                               |
| (3) Damaged plus potential for damage   | (3) Enclosure                                   |
| <input checked="" type="checkbox"/> (4) Damaged plus low potential for damage | (4) Repair                                      |
| (5) ACM (good condition) with potential for significant damage                | (5) Operations and Maintenance Program          |
| (6) ACM (good condition) with potential for damage                            |   |
| (7) Any remaining friable ACM or friable suspect ACM                          |   |
| (8) Non-friable ACM   |   |

**COMMENTS:** Material should be removed prior to renovation or demolition.

**HAZARD ASSESSMENT AND RESPONSE ACTION DATA  
FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** 33-3-1, 33-3-2, and 33-3-3

**HOMOGENEOUS AREA No.:** 18

**TYPE OF MATERIAL:** Surfacing  TSI Other

**Description:** Pipe Fitting Insulation, 3" with canvas wrap on steam

**Approximate Amount of Asbestos-Containing Material (Linear or Square Foot):** 300 EA

**Approximate Recommended Response Action Cost:**

**HAZARD ASSESSMENT**

**RESPONSE ACTION RECOMMENDATION**

- |   |   |
|---|---|
| (1) Significantly damaged   | <input checked="" type="checkbox"/> (1) Removal |
| (2) Damaged plus potential for significant damage                             | (2) Encapsulation                               |
| (3) Damaged plus potential for damage   | (3) Enclosure                                   |
| <input checked="" type="checkbox"/> (4) Damaged plus low potential for damage | (4) Repair                                      |
| (5) ACM (good condition) with potential for significant damage                | (5) Operations and Maintenance Program          |
| (6) ACM (good condition) with potential for damage                            |   |
| (7) Any remaining friable ACM or friable suspect ACM                          |   |
| (8) Non-friable ACM   |   |

**COMMENTS:** Material should be removed prior to renovation or demolition.

**HAZARD ASSESSMENT AND RESPONSE ACTION DATA  
FOR IDENTIFIED ACM**

**BUILDING:** Charleston Naval Shipyard, Building Number 35

**SAMPLE NUMBER(S):** Exterior Pipe-32

**HOMOGENEOUS AREA No.:** 22

**TYPE OF MATERIAL:** Surfacing  TSI  Other

**Description:** Pipe Insulation, 12" with metal wrap

**Approximate Amount of Asbestos-Containing Material (Linear or Square Foot):** 160 LF

**Approximate Recommended Response Action Cost:**

**HAZARD ASSESSMENT**

**RESPONSE ACTION RECOMMENDATION**

- |   |   |
|---|---|
| (1) Significantly damaged   | <input checked="" type="checkbox"/> (1) Removal |
| (2) Damaged plus potential for significant damage                         | (2) Encapsulation                               |
| <input checked="" type="checkbox"/> (3) Damaged plus potential for damage | (3) Enclosure                                   |
| (4) Damaged plus low potential for damage                                 | (4) Repair                                      |
| (5) ACM (good condition) with potential for significant damage            | (5) Operations and Maintenance Program          |
| (6) ACM (good condition) with potential for damage                        |   |
| (7) Any remaining friable ACM or friable suspect ACM                      |   |
| (8) Non-friable ACM   |   |

**COMMENTS:** Material should be removed prior to renovation or demolition.

### 10.0 PRELIMINARY COST ESTIMATE FOR REMOVAL OF IDENTIFIED ACM

The following is a preliminary cost estimate for the abatement (removal) of identified ACM in Building 35. This estimate is based on removing all of the materials during the same project. It does not include the cost of replacement materials. The cost estimate includes, project surveillance, air monitoring, and disposal of materials. These costs are estimates only; BAT made no attempt to obtain bids from removal contractors for this work, however, the average unit costs of three asbestos abatement contractors were used to develop the preliminary removal costs. Additionally, quantities noted are based upon engineering measurements. BAT recommends the use of architectural measurements for more accurate quantification.

<b>Material Description</b>	<b>Unit Cost (\$)</b>	<b>Quantity</b>	<b>Total Abatement Cost (\$)</b>
Floor Tile (multi-layers) with Mastic	2.78	21,000 SF	58,380
Pipe Insulation (25-30 feet above ground)	5.25	160 LF	840
Pipe Fitting Insulation (including demolition of walls)	32.59	675 EA	21,998
Handling Cost	25.00	134EA	3,350
Mobilization	300.00	3 EA	900
Waste Disposal Cost	<u>50.00</u>	<u>8 CY</u>	<u>400</u>
<b>Removal Subtotal</b>			<b>85,868</b>
<b>IH Supervision and Monitoring</b>			<b><u>10,750</u></b>
<b>Project Subtotal</b>			<b>96,618</b>
<b>Contingency (34%)</b>			<b><u>32,850</u></b>
<b>Project Total</b>			<b>129,468</b>

SF = Square Feet    LF = Linear Feet    EA = Each    CY = Cubic Yard

## 11.0 CONCLUSIONS

Inspection of Building 35 and confirmatory laboratory bulk sample analysis of selected samples identified the following materials with asbestos concentrations greater than one percent.

<u>Identified ACM</u>	<u>Quantity</u>	<u>NESHAP Category</u>
Floor Tile, 9" x 9" black w/ black mastic	21,000 SF	Category I, non-friable
Floor Tile, 12" x 12" brown with light and dark streaks w/ black mastic	5,230 SF	Category I, non-friable
Floor Tile, 12" x 12" off-white with brown streaks w/ black mastic	7,420 SF	Category I, non-friable
Floor Tile, 12" x 12" off-white with beige streaks w/ black mastic	7,140 SF	Category I, non-friable
Pipe Fitting Insulation, 3" with canvas wrap on	300 EA	Regulated, friable
Pipe Insulation, 12" with metal wrap	160 LF	Regulated, friable

The following materials were not sampled in order to avoid disrupting their integrity, and they were assumed to contain asbestos:

<u>Assumed ACM</u>	<u>Quantity</u>	<u>NESHAP Category</u>
Pipe Fitting Insulation, 3" with canvas wrap on domestic water	375 EA	Regulated, friable

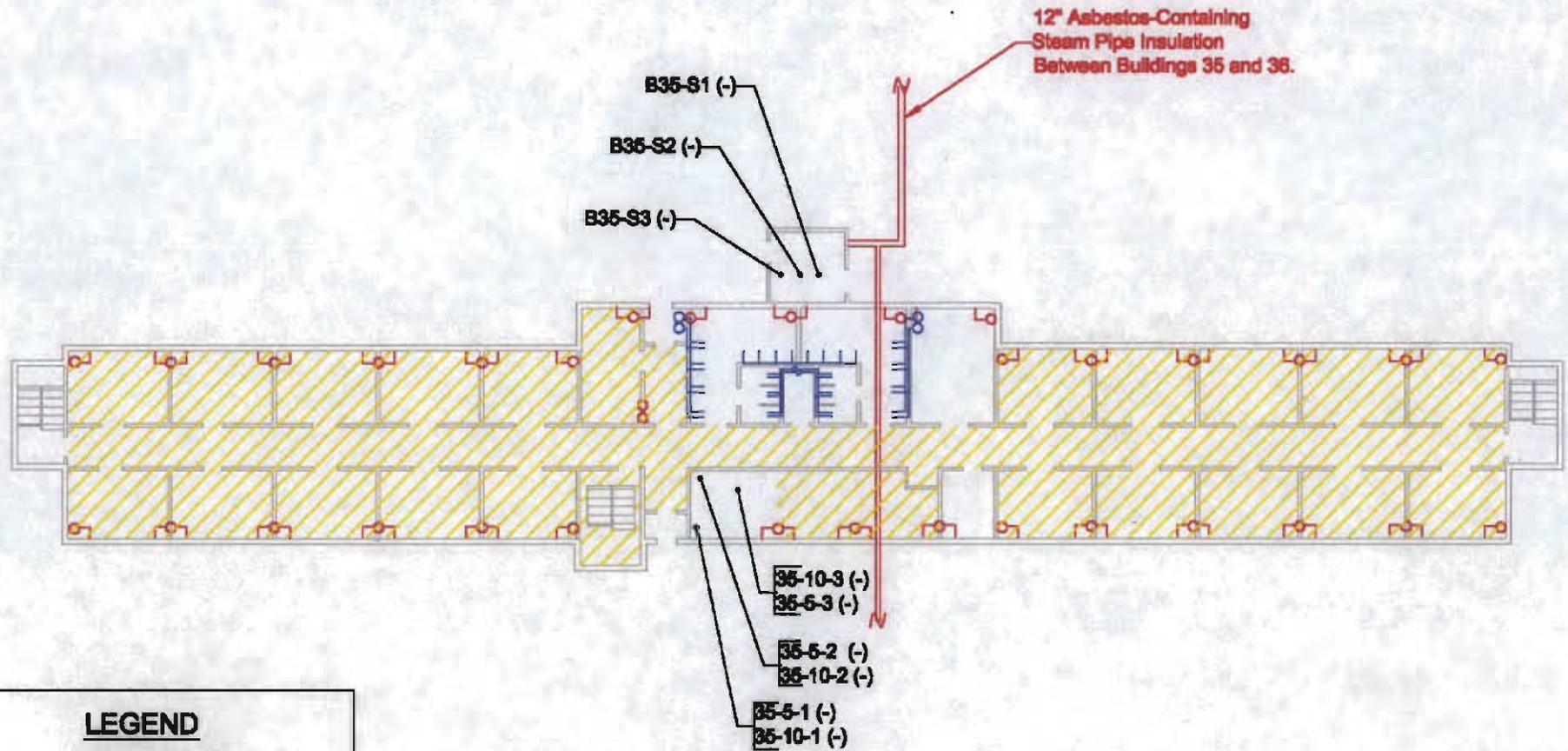
Other suspect ACM not identified could be present in areas of the building inaccessible to the asbestos-building inspectors. For example, material could exist in walls and other locations where access could only be gained by demolition of the building. Also, other materials currently not recognized as ACM by the asbestos building inspection industry could exist.

Rooms that were inaccessible to the asbestos-building inspectors have been identified on the drawings of the building in Appendix B, *Sample and ACM Location Drawings*.

EPA rules governing the application, removal and disposal of ACM were promulgated under NESHAP [40 CFR 61 Part M]. NESHAP requires the building owner or asbestos removal contractor to notify EPA when a building containing ACM is to be renovated, ACM is to be removed, or the building is to be demolished. At least 20 days notification is required "...if less than 260 linear feet of asbestos pipe covering or 160 square feet of asbestos material are removed during building renovation". Ten days notification is required when the amount is greater than 260 linear feet or 160 square feet of friable ACM.

**APPENDIX A**

**SAMPLE AND ACM LOCATION DRAWINGS**



**LEGEND**

- - Sample Location
- (-) - Non-Asbestos-Containing Sample Location

-  - Asbestos-Containing Floor Tile and Mastic
-  - Asbestos-Containing Pipe Fitting Insulation on Riser and Branches to Radiator
-  - Asbestos-Containing Pipe Fitting Insulation on Domestic Water (Inaccessible in Walls)

**BUILDING 35  
FIRST FLOOR**

Sample and Asbestos-Containing Material Locations



12" Asbestos-Containing  
Steam Pipe Insulation  
Between Buildings 35 and 38.

B35-S1 (-)

B35-S2 (-)

B35-S3 (-)

35-10-3 (-)

35-6-3 (-)

35-5-2 (-)

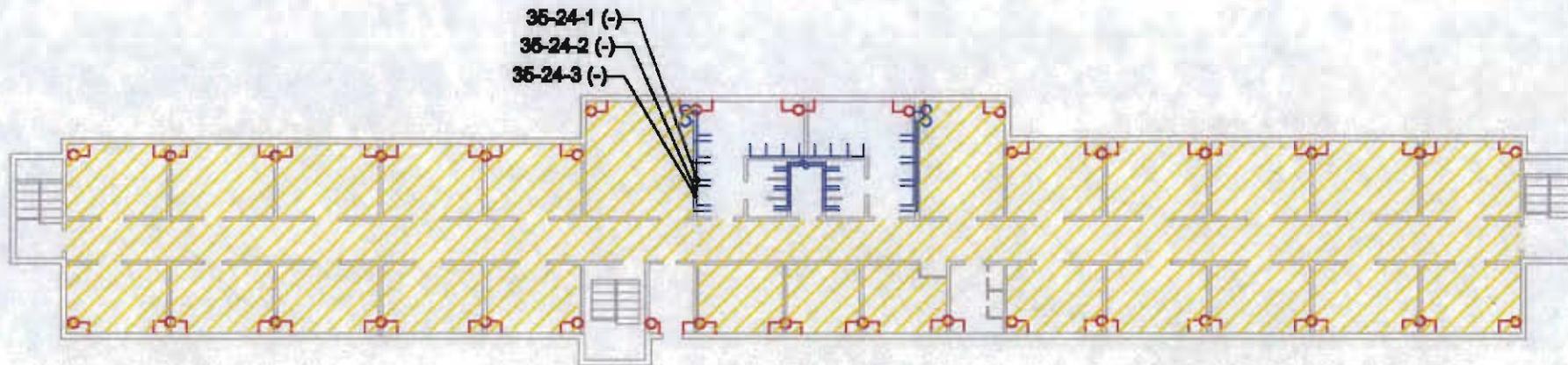
35-10-2 (-)

35-5-1 (-)

35-10-1 (-)

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ENVIRONMENTAL, HEALTH & SAFETY SERVICES  
5151 BROOK HOLLOW PARKWAY, SUITE 250  
NORCROSS, GA 30071



35-24-1 (-)  
 35-24-2 (-)  
 35-24-3 (-)

**LEGEND**

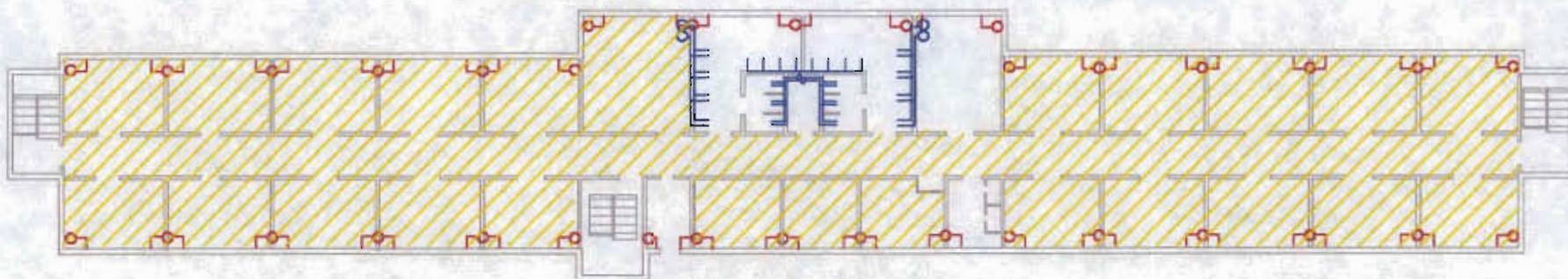
- - Sample Location
- (-) - Non-Asbestos-Containing Sample Location
-  - Asbestos-Containing Floor Tile and Mastic
-  - Asbestos-Containing Pipe Fitting Insulation on Riser and Branches to Radiator
-  - Asbestos-Containing Pipe Fitting Insulation on Domestic Water (Inaccessible in Walls)

**BUILDING 35  
 SECOND FLOOR**

Sample and Asbestos-Containing Material Locations



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 NORCROSS, GA 30071



**LEGEND**

-  - Asbestos-Containing Floor Tile and Mastic
-  - Asbestos-Containing Pipe Fitting Insulation on Riser and Branches to Radiator
-  - Asbestos-Containing Pipe Fitting Insulation on Domestic Water (Inaccessible in Walls)

**BUILDING 35**

**THIRD FLOOR**

Asbestos-Containing Material Locations



**BAT Associates, Inc.**

ENVIRONMENTAL, HEALTH & SAFETY SERVICES  
 5151 BROOK HOLLOW PARKWAY, SUITE 250  
 NORCROSS, GA 30071

**APPENDIX B**  
**PHOTOGRAPHIC DOCUMENTATION**  
**OF IDENTIFIED ACM**

**POLARIZED LIGHT MICROSCOPY (PLM)  
BULK SAMPLE ANALYSIS REPORT**

CLIENT NAME: BAT ASSOCIATES LAB JOB NO: B9334-1  
PROJECT NAME: CHARLESTON NSY / 971001-13.03 DATE RECEIVED: 12/16/99  
PROJECT NO: L80ZZ.000 REPORT ISSUED: 1/13/00  
SAMPLE FIELD ID: 36-4-3 LAB ID: 928049  
SAMPLE INFO: DATE ANALYZED: 1/7/00

**SAMPLE DESCRIPTION**

LAYERED: NO

APPEARANCE: GRAY HARD SILTY

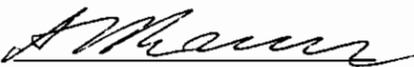
**RESULT OF ANALYSIS IN VOLUME PERCENTAGE (BY VISUAL ESTIMATE)**

ASBESTOS FIBERS		NONASBESTOS FIBERS		NONFIBROUS COMPONENTS		OTHER COMPONENTS	
CHRYBOTILE		CELLULOSE		VERMICULITE/MICA		BITUMEN/TAR	
AMOSITE		GLASS FIBERS		PERLITE		SAND/AGGR.	5
CROCIDOLITE		SYNTHETICS		EXPANDED GLASS		GLUE/CAULK	
TREMOLITE		WOLLASTONITE		SYNTHETIC FOAM		VINYL	
ACTINOLITE		TALC		ALUMINUM/METAL		CORK	
ANTHOPHYLLITE				FOAM RUBBER		LATEX/RUBBER	
						PAINT/OTHER	95

**COMMENTS:**

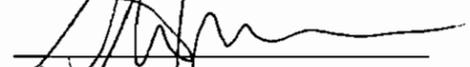
SAMPLE WAS ANALYZED BY PLM USING DISPERSION STAINING TECHNIQUES IN ACCORDANCE WITH U.S. EPA METHOD 40CFR Ch. I (7-1-92 ) PT. 763, SUBPT. F, APP. A. LAST CALIBRATION OF EQUIPMENT WAS PERFORMED ON: 1/7/00 FOR ALL HETEROGENEOUS AND LAYERED SAMPLES EASILY SEPARATED INTO SUBLAYERS, EACH LAYER IS ANALYZED SEPARATELY.  
REPORT 1 OF 1

ANALYST



ALEKSEY REZNIK

QUALITY CONTROL



STEVE JARVIS



**ANALYTICAL ENVIRONMENTAL SERVICES, INC.**  
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**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc. Project Number: 971001  
 Project Name: Charleston Naval Shipyard AES Lab ID: 3417  
 Client Sample ID: 36-15-1  
 Location: Not given

Sample Description: Layered: 1) Black semi-hard bitumenous; 2) Black semi-hard bitumenous to fibrous; 3) Brown soft fibrous to perlitic.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	5
Fiberglass:	
Cellulose:	30
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	5
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	60
Resilient Material:	
Glue:	
Binders:	

**COMMENTS:**

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

All percentages given are by volume visually estimated. All analyses are performed in accordance with the EPA "Method for the Determination of Asbestos in Bulk Building Materials, EPA/600/R-93/116, July 1993." This report must not be reproduced except in full with the approval of Analytical Environmental Services, Inc. These test results apply only to the samples actually tested. The refractive index was determined by using "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method" by Shu-Chun Su, Ph.D.



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**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc.  
 Project Name: Charleston Naval Shipyard  
 Client Sample ID: 36-15-2  
 Location: Not given  
 Project Number: 971001  
 AES Lab ID: 3418

Sample Description: Layered: 1) Black semi-hard bitumenous; 2) Black semi-hard bitumenous to fibrous; 3) Brown soft fibrous to perlitic.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	5
Fiberglass:	
Cellulose:	30
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	5
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	60
Resilient Material:	
Glue:	
Binders:	

COMMENTS:

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

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**BULK SAMPLE ANALYSIS**

Client Name: **B A T Associates, Inc.**  
 Project Name: **Charleston Naval Shipyard** Project Number **971001**  
 Client Sample ID: **36-15-3** AES Lab ID: **3419**  
 Location: **Not given**

Sample Description: Layered: 1) Black semi-hard bitumenous with aggregates; 2) Black semi-hard bitumenous to fibrous.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	10
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	65
Fiberglass:		Resilient Material:	
Cellulose:	25	Glue:	
Animal Hair:		Binders:	
Antigorite:			

**COMMENTS:**

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

All percentages given are by volume visually estimated. All analyses are performed in accordance with the EPA "Method for the Determination of Asbestos in Bulk Building Materials, EPA/600/R-93/116, July 1993." This report must not be reproduced except in full with the approval of Analytical Environmental Services, Inc. These test results apply only to the samples actually tested. The refractive index was determined by using "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method" by Shu-Chun Su, Ph.D.



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**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc. Project Number 971001  
 Project Name: Charleston Naval Shipyard AES Lab ID: 3393  
 Client Sample ID: Exterior Pipe - 32  
 Location: Not given

Sample Description: Layered: 1) Light brown semi-hard fibrous with aluminum; 2) Gray soft powdery to fibrous.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	15
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	5
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	5
Bitumen:	
Resilient Material:	
Glue:	
Binders:	75

COMMENTS: Layer #2 contains 15% amosite. Layer #1 does not contain asbestos.

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAlyst:

Svetlana Arkhipov

All percentages given are by volume visually estimated. All analyses are performed in accordance with the EPA "Method for the Determination of Asbestos in Bulk Building Materials, EPA/600/R-93/116, July 1993." This report must not be reproduced except in full with the approval of Analytical Environmental Services, Inc. These test results apply only to the samples actually tested. The refractive index was determined by using "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method" by Shu-Chun Su, Ph.D.



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**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc. Project Number 971001  
 Project Name: Charleston Naval Shipyard AES Lab ID: 3408  
 Client Sample ID: B35-S1  
 Location: Not given

Sample Description: Layered: 1) Red semi-hard silty to woven; 2) Gray semi-hard silty to fibrous; 3) Light gray soft fibrous.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	15
Fiberglass:	50
Cellulose:	
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	35

COMMENTS:

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

All percentages given are by volume visually estimated. All analyses are performed in accordance with the EPA "Method for the Determination of Asbestos in Bulk Building Materials, EPA/600/R-93/116, July 1993." This report must not be reproduced except in full with the approval of Analytical Environmental Services, Inc. These test results apply only to the samples actually tested. The refractive index was determined by using "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method" by Shu-Chun Su, Ph.D.



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**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc. Project Number 971001  
 Project Name: Charleston Naval Shipyard AES Lab ID: 3409  
 Client Sample ID: B35-S2  
 Location: Not given

Sample Description: Layered: 1) Red semi-hard silty to woven; 2) Gray semi-hard silty to fibrous; 3) Light gray soft fibrous.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	
NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	15
Fiberglass:	50
Cellulose:	
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	
Styrofoam:	
OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	35

**COMMENTS:**

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst

Svetlana Arkhipov

QCAlyst

Andrew Pittman

All percentages given are by volume visually estimated. All analyses are performed in accordance with the EPA "Method for the Determination of Asbestos in Bulk Building Materials, EPA/600/R-93/116, July 1993." This report must not be reproduced except in full with the approval of Analytical Environmental Services, Inc. These test results apply only to the samples actually tested. The refractive index was determined by using "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method" by Shu-Chun Su, Ph.D.



**ANALYTICAL ENVIRONMENTAL SERVICES, INC.**  
 3125 Marjan Drive  
 Atlanta, GA 30340  
 Tel: (770) 457-8177  
 Fax: (770) 457-8188

AES Job Number: B212  
 Page 40 of 183 Total Samples  
 Wednesday, February 09, 2000



**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc. Project Number 971001  
 Project Name: Charleston Naval Shipyard AES Lab ID: 3410  
 Client Sample ID: B35-S3  
 Location: Not given

Sample Description: Layered: 1) Red semi-hard silty to woven; 2) Gray soft powdery to fibrous.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:	5	Resilient Material:	
Cellulose:	25	Glue:	
Animal Hair:		Binders:	70
Antigorite:			

COMMENTS: Floor tile contains 3 % chrysotile. Bitumen contains 5 % chrysotile. Glue does not contain asbestos.

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst

Svetlana Arkhipov

QCAlyst

Andrew Pittman

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AES Job Number: B212  
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 Wednesday, February 09, 2000



**BULK SAMPLE ANALYSIS**

Client Name: B A T Associates, Inc. Project Number: 971001  
 Project Name: Charleston Naval Shipyard AES Lab ID: 3390  
 Client Sample ID: 35-24-1  
 Location: Not given

Sample Description: Black semi-hard bitumenous with fibers.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	3
Mineral Wool:	
Fiberglass:	
Cellulose:	2
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	90
Resilient Material:	
Glue:	
Binders:	5

**COMMENTS:**

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAlyst:

Svetlana Arkhipov

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AES Job Number: B212  
 Page 21 of 183 Total Samples  
 Wednesday, February 09, 2000



**BULK SAMPLE ANALYSIS**

Client Name:	B A T Associates, Inc.	Project Number	971001
Project Name:	Charleston Naval Shipyard	AES Lab ID:	3391
Client Sample ID:	35-24-2		
Location:	Not given		

Sample Description: Black semi-hard bitumenous with fibers.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	3
Mineral Wool:	
Fiberglass:	
Cellulose:	2
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	90
Resilient Material:	
Glue:	
Binders:	5

COMMENTS:

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCAAnalyst:

Svetlana Arkhipov

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AES Job Number: B212  
 Page 22 of 183 Total Samples  
 Wednesday, February 09, 2000



**BULK SAMPLE ANALYSIS**

Client Name:	B A T Associates, Inc.	Project Number	971001
Project Name:	Charleston Naval Shipyard	AES Lab ID:	3392
Client Sample ID:	35-24-3		
Location:	Not given		

Sample Description: Black semi-hard bitumenous with fibers.

**All percentages given below are visually estimated by volume**

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:	3	Aluminum:	
Mineral Wool:		Bitumen:	90
Fiberglass:		Resilient Material:	
Cellulose:	2	Glue:	
Animal Hair:		Binders:	5
Antigorite:			

**COMMENTS:**

It is certified by the signatures below that the laboratory identified is accredited by the National Institute of Standards and Technology for Polarized Light Microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Quality Assurance Program, Laboratory 102082-0.

Microanalyst:

Svetlana Arkhipov

QCA Analyst:

Svetlana Arkhipov

All percentages given are by volume visually estimated. All analyses are performed in accordance with the EPA "Method for the Determination of Asbestos in Bulk Building Materials, EPA/600/R-93/116, July 1993." This report must not be reproduced except in full with the approval of Analytical Environmental Services, Inc. These test results apply only to the samples actually tested. The refractive index was determined by using "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method" by Shu-Chun Su, Ph.D.

# BAT

BAT Associates, Inc.  
ENVIRONMENTAL, HEALTH & SAFETY SERVICES

5151 Brook Hollow Pkwy., Suite 250  
Norcross, GA 30071  
Phone: (770) 242-39031  
Fax: (770) 242-3912

## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT      DOUGLAS J. MILTON	
BAT JOB NAME      Charleston Naval Shipyard	BAT JOB NO. 971001      TASK NO. 13.03
ANALYSIS REQUESTED <input checked="" type="checkbox"/> PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____	
CHECK ONE: <input type="checkbox"/> ROUTINE <input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN)      AS SOON AS POSSIBLE <input type="checkbox"/> RUSH - FAX (HANDWRITTEN)      AS SOON AS POSSIBLE	
SAMPLE ID	SAMPLE ID
1. 31-2-1	16. 31-12-1
2. 31-2-2	17. 31-12-2
3. 31-2-3	18. 31-12-3
4. 31-5-1	19. 31-13-1
5. 31-5-2	20. 31-13-2
6. 31-5-3	21. 31-13-3
7. 31-9-1	22. 31-16-1
8. 31-9-2	23. 31-16-2
9. 31-9-3	24. 31-16-3
10. 31-10-1	25.
11. 31-10-2	26.
12. 31-10-3	27.
13. 31-11-1	28.
14. 31-11-2	29.
15. 31-11-3	30.
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area tile positive</i>	
Relinquished by: <i>Justin Bell</i>	Received by: <i>Jennifer Ross</i>
Date: <i>1/31/00</i> Time: <i>1:57</i>	Date: <b>FEB 01 2000</b> Time:

*21100 NAU Y BILL RATE*

# BAT

BAT Associates, Inc.  
ENVIRONMENTAL, HEALTH & SAFETY SERVICES

5151 Brook Hollow Pkwy., Suite 250  
Norcross, GA 30071  
Phone: (770) 242-39032  
Fax: (770) 242-3912

## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT		DOUGLAS J. MILTON	
BAT JOB NAME		BAT JOB NO.	TASK NO.
Charleston Naval Shipyard		971001	13.03
ANALYSIS REQUESTED <input checked="" type="checkbox"/> PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____			
CHECK ONE: <input type="checkbox"/> ROUTINE			
<input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN)		AS SOON AS POSSIBLE	
<input type="checkbox"/> RUSH - FAX (HANDWRITTEN)		AS SOON AS POSSIBLE	
SAMPLE ID		SAMPLE ID	
1. 32-2-1	16. 32-7-1		
2. 32-2-2	17. 32-7-2		
3. 32-2-3	18. 32-7-3		
4. 32-3-1	19. 32-8-1		
5. 32-3-2	20. 32-8-2		
6. 32-3-3	21. 32-8-3		
7. 32-4-1	22. 32-11-1		
8.. 32-4-2	23. 32-11-2		
9. 32-4-3	24. 32-11-3		
10. 32-5-1	25.		
11. 32-5-2	26.		
12. 32-5-3	27.		
13. 32-6-1	28.		
14. 32-6-2	29.		
15. 32-6-3	30.		
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area till positive</i>			
Relinquished by: <i>Joshie Bell</i>		Received by: <i>Jennifer Ross</i>	
Date: <i>1/31/00</i>	Time: <i>1357</i>	Date: <i>FEB 01 2000</i>	Time:

*2/1/00 NAUQ BILL RATE*

# BAT

BAT Associates, Inc.  
ENVIRONMENTAL, HEALTH & SAFETY SERVICES

5151 Brook Hollow Pkwy., Suite 250  
Norcross, GA 30071  
Phone: (770) 242-39034  
Fax: (770) 242-3912

## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT      DOUGLAS J. MILTON	
BAT JOB NAME      Charleston Naval Shipyard	BAT JOB NO. 971001      TASK NO. 13.03
ANALYSIS REQUESTED <input checked="" type="checkbox"/> PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____	
CHECK ONE: <input type="checkbox"/> ROUTINE <input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN)      AS SOON AS POSSIBLE <input type="checkbox"/> RUSH - FAX (HANDWRITTEN)      AS SOON AS POSSIBLE	
SAMPLE ID	SAMPLE ID
1. 33-4-1	16.
2. 33-4-2	17.
3. 33-4-3	18.
4. 33-5-1	19.
5. 33-5-2	20.
6. 33-5-3	21.
7. 33-8-1	22.
8.. 33-8-2	23.
9. 33-8-3	24.
10. 33-9-1	25.
11. 33-9-2	26.
12. 33-9-3	27.
13. 33-11-1	28.
14. 33-11-2	29.
15. 33-11-3	30.
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area till positive</i>	
Relinquished by: <i>Foshie Bell</i>	Received by: <i>Jenny Star Ross</i>
Date: <i>1/33/00</i> Time: <i>1357</i>	Date: <i>FEB 01 2000</i> Time:

*4/1/00* NAVY BRU ratp

# BAT

BAT Associates, Inc.  
ENVIRONMENTAL, HEALTH & SAFETY SERVICES

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Norcross, GA 30071  
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## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT		DOUGLAS J. MILTON	
BAT JOB NAME		BAT JOB NO.	TASK NO.
Charleston Naval Shipyard		971001	13.03
ANALYSIS REQUESTED <input checked="" type="checkbox"/> PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____			
CHECK ONE: <input type="checkbox"/> ROUTINE			
<input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN)		AS SOON AS POSSIBLE	
<input type="checkbox"/> RUSH - FAX (HANDWRITTEN)		AS SOON AS POSSIBLE	
SAMPLE ID		SAMPLE ID	
1. 34-3-1	16. 34-10-1		
2. 34-3-2	17. 34-10-2		
3. 34-3-3	18. 34-10-3		
4. 34-4-1	19. 34-11-1		
5. 34-4-2	20. 34-11-2		
6. 34-4-3	21. 34-11-3		
7. 34-5-1	22. 34-12-1		
8. 34-5-2	23. 34-12-2		
9. 34-5-3	24. 34-12-3		
10. 34-6-1	25. 34-19-1		
11. 34-6-2	26. 34-19-2		
12. 34-6-3	27. 34-19-3		
13. 34-8-1	28.		
14. 34-8-2	29.		
15. 34-8-3	30.		
SPECIAL INSTRUCTIONS: Analyze each homogeneous <sup>Area</sup> <del>area</del> tie positive			
Relinquished by: <i>Joshie Bell</i>		Received by: <i>Jennylyn Ross</i>	
Date: 1/31/00	Time: 1:57	Date: FEB 01 2000	Time:

21100 NAVY BILL RATE

# BAT

BAT Associates, Inc.

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## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT		DOUGLAS J. MILTON	
BAT JOB NAME		BAT JOB NO.	TASK NO.
Charleston Naval Shipyard		971001	13.03
ANALYSIS REQUESTED <input checked="" type="checkbox"/> PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____			
CHECK ONE: <input type="checkbox"/> ROUTINE			
<input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN) AS SOON AS POSSIBLE			
<input type="checkbox"/> RUSH - FAX (HANDWRITTEN) AS SOON AS POSSIBLE			
SAMPLE ID		SAMPLE ID	
1. 35-5-1		16.	
2. 35-5-2		17.	
3. 35-5-3		18.	
4. 35-10-1		19.	
5. 35-10-2		20.	
6. 35-10-3		21.	
7. 35-24-1		22.	
8. 35-24-2		23.	
9. 35-24-3		24.	
10.		25.	
11.		26.	
12.		27.	
13.		233.	
14.		29.	
15.		30.	
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area tile positive</i>			
Relinquished by: <i>Foshee Bell</i>		Received by: <i>Jonnystar Ross</i>	
Date: <i>1/33/00</i> Time: <i>1357</i>		Date: <b>FEB 01 2000</b> Time:	

*41100 NAVY BILL RATE*

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BAT Associates, Inc.

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Norcross, GA 30071

Phone: (770) 242-39034

Fax: (770) 242-3912

## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT		DOUGLAS J. MILTON	
BAT JOB NAME	Charleston Naval Shipyard	BAT JOB NO. 971001	TASK NO. 13.03
ANALYSIS REQUESTED		■ PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____	
CHECK ONE:	<input type="checkbox"/> ROUTINE		
	<input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN)	AS SOON AS POSSIBLE	
	<input type="checkbox"/> RUSH - FAX (HANDWRITTEN)	AS SOON AS POSSIBLE	
SAMPLE ID		SAMPLE ID	
1. 36-4-1		16.	
2. 36-4-2		17.	
3. 36-4-3		18.	
4. 36-5-1		19.	
5. 36-5-2		20.	
6. 36-5-3		21.	
7. 36-15-1		22.	
8. 36-15-2		23.	
9. 36-15-3		24.	
10. 36-16-1		25.	
11. 36-16-2		26.	
12. 36-16-3		27.	
13.		28.	
14.		29.	
15.		30.	
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area till positive</i>			
Relinquished by: <i>Joshie Bell</i>		Received by: <i>Jennyfer Ross</i>	
Date: <i>1/33/00</i>	Time: <i>1357</i>	Date: <b>FEB 01 2000</b>	Time:

*41100*

*NAVY BILL ratp*

## CHAIN OF CUSTODY FORM

BAT PROJECT CONTACT <b>DOUGLAS J. MILTON</b>	
BAT JOB NAME <b>Charleston Naval Shipyard</b>	BAT JOB NO. <b>971001</b> TASK NO. <b>13.03</b>
ANALYSIS REQUESTED <input checked="" type="checkbox"/> PLM <input type="checkbox"/> PCM <input type="checkbox"/> AAS For Lead Content <input type="checkbox"/> OTHER _____	
CHECK ONE: <input type="checkbox"/> ROUTINE <input checked="" type="checkbox"/> ROUTINE - FAX (HANDWRITTEN)      AS SOON AS POSSIBLE <input type="checkbox"/> RUSH - FAX (HANDWRITTEN)      AS SOON AS POSSIBLE	
SAMPLE ID	SAMPLE ID
1. Exterior Pipe-32	16. B35-S1
2. Exterior Pipe-34	17. B35-S2
3. Exterior Pipe-36	18. B35-S3
4. B31-S1	19.
5. B31-S2	20.
6. B31-S3	21.
7. B32-S1	22.
8. B32-S2	23.
9. B32-S3	24.
10. B33-S1	25.
11. B33-S2	26.
12. B33-S3	27.
13. B34-S1	233.
14. B34-S2	29.
15. B34-S3	30.
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area also positive</i>	
Relinquished by: <i>Ashie Bell</i>	Received by: <i>Jonnylar Ross</i>
Date: <i>1/33/00</i> Time: <i>1357</i>	Date: <b>FEB 01 2000</b> Time:

*2/1/00*      *NAVY BILL rate*