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ASBESTOS CONTAINING MATERIAL RE-INSPECTION BUILDING 180 VOLUME 13 CNC
CHARLESTON SC
2/15/2000
BAT ASSOCIATES, INC.

Volume 13

**Asbestos-Containing Material Re-inspection
For Building 180
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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1.0 EXECUTIVE SUMMARY

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 Building 180 located at the Charleston Naval Shipyard (CNS) in Charleston, South Carolina.

A list of ACM identified in Building 180 is summarized in Table 1.0.

Table 1.0
Summary of Identified ACM

HA No.	Material Description	Sample Analysis Results	Approx. Quantity of ACM	NESHAP Category
7	Floor Tile, 9" x 9" dark brown w/ black mastic	27% chrysotile	7,890 SF	Category I, non-friable
9	Pipe Insulation, white with cloth wrap	10% chrysotile, 40% amosite	325 LF	Regulated, friable
29	Floor Tile, 9" x 9" light brown with white w/ black mastic	2% chrysotile	20 SF	Category I, non-friable
31	Floor Tile, 12" x 12" white with black w/ black mastic	5% chrysotile	200 SF	Category I, non-friable
32	Window Glazing, gray exterior	2% chrysotile	3,160 LF	Regulated, friable
34	Roof Flashing	3% chrysotile	300 SF	Category I, non-friable

NOTES:

HA = Homogeneous Area SF = Square Feet EA = Each

- One percent or less asbestos content is considered a non-asbestos-containing material by EPA and the State of South Carolina.
- Federal and state regulations require a minimum of three non-asbestos-containing analysis results per homogeneous area (material) to classify that material as being a non-asbestos-containing material. However, one "positive" asbestos-containing analysis result would classify that material as being an asbestos-containing material.
- No Quality Control discrepancies were noted.

BAT recommends the following management actions for the identified ACM in Building 180 in Table 2.0.

Table 2.0
Recommended Response Actions

HA No.	Material Description	Recommended Response Action
7	Floor Tile, 9" x 9" dark brown w/ black mastic	O&M Plan
9	Pipe Insulation, white with cloth wrap	Repair and O&M Plan
29	Floor Tile, 9" x 9" light brown with white w/ black mastic	O&M Plan

HA No.	Material Description	Recommended Response Action
31	Floor Tile, 12" x 12" white with black w/ black mastic	O&M Plan
32	Window Glazing, gray exterior	Removal
34	Roof Flashing	O&M Plan

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 180 is approximately \$51,500. 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: Recreation Building
Building Number: 180
Facility: Charleston Naval Shipyard
Building Area (square footage): 37,206
Year Built: 1959
Building Type: Recreation
No. of Floors in Building: Two
Purpose of ACM Survey: Re-Inspection
Facility Unit Identification Code (UIC): N/A

Building Contact: Mr. Matthew Humphrey
Contact's Telephone No.: (843) 743-8895
Building Survey Date(s): January 27, 2000

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

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 180.

This re-inspection survey was performed by Mr. Foshie Bell, under the direct supervision of Mr. Douglas J. Milton, CIH, on January 27, 2000. 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 763.86, 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 763.87 subpart F. Copies of the laboratory accreditations for both laboratories may be found in Appendix D.

5.0 ASBESTOS INVENTORY AND ASSESSMENT

Table 3.0 describes the suspect ACM identified in and around Building 180.

**Table 3.0
 Summary of Identified Suspect ACM**

HA No.	Description of Suspect ACM	Location of Suspect ACM	AHERA Category of Material
1	Mortar, gray	Majority of room throughout the building	N/A
2	Plaster, gray	First floor, room 100; second floor, rooms 207 and 208	N/A
3	Floor Tile, 12" x 12" beige w/ brown mastic	First floor, rooms 101, 104, 106, and 109	N/A
4	Mastic, brown on cove base	First floor, rooms 101 and 104; second floor, rooms 202, 206, 209, 212, 213, 214, 215, 216, 217, and H-206	N/A
5	Caulking, yellow/brown	Not identified during re-inspection	N/A
6	Caulking, white	First floor, rooms 102, 105, 108, M-100, M-101, and on the exterior of the building	N/A
7	Floor Tile, 9" x 9" dark brown w/ black mastic	First floor, room 106; second floor, rooms 200, 202, 204, 206, 207, 208, 209, 211, 212, 213, 214, 215, 216, 217, 218; corridors H-100, H-101, H-200, H-201, H-202, and H-204	Misc.
8	Mastic, black on cove base	First floor, rooms 106 and 109; second floor, rooms 200, 204, 206, 207, 208, 213, 218; corridors H-100, H-101, H-200, H-201, H-202, H-203, H-204; and stairway S-002	N/A
9	Pipe Insulation, white with cloth wrap	First floor, rooms 103, 106, 126, M-101, and M-102	TSI
10	Mortar, gray	First floor, room 108	N/A
11	Terrazzo, gray	First floor, room 108	N/A
12	Ceiling Tile, 2' x 2', white with long grooves	First floor, room 108	N/A
13	Grouting, gray on ceramic tile	First floor, rooms 110, 111, 116, 122, and 124; second floor, rooms 201 and 205	N/A
14	Grouting, white on ceramic tile	First floor, rooms 110, 111, 116, 122, and 124; second floor, room 205	N/A
15	Pipe Fitting Insulation, white with cloth wrap	First floor, rooms 103, 106, 112, and 125; second floor, rooms 201 and 202	N/A
16	Drywall, with white joint mud and	Not identified during re-inspection	N/A

HA No.	Description of Suspect ACM	Location of Suspect ACM	AHERA Category of Material
	tape		
17	Grouting, gray on ceramic tile	First floor, rooms 115 and 121	N/A
18	Floor Tile, 12" x 12" cream w/ brown mastic	First floor, room 119	N/A
19	Mastic, on red rubber floor mats	Not identified during re-inspection	N/A
20	Mastic, on gray rubber floor mats	Not identified during re-inspection	N/A
21	Flexible Duct Connector, gray	Second floor, rooms 202, 203, 209, and 219	N/A
22	Duct Joint Sealer, white	Second floor, room 202	N/A
23	Duct Joint Sealer, green/black	Second floor, room 202	N/A
24	Ceiling Tile, 1' x 1' gray	Second floor, rooms 202, 204; and stairway S-001	N/A
25	Floor Tile, 12" x 12" white with gray w/ brown mastic	Second floor, rooms 204, 207, and 208; corridors H-202, H-203, and H-204; and stairway S-002	N/A
26	Grouting, gray on ceramic tile	Second floor, room 201	N/A
27	Ceiling Tile, 2' x 2' white with short grooves	Second floor, rooms 207 and 208	N/A
28	Drywall, white with vinyl cover	Second floor, rooms 207, 209, and 211	N/A
29	Floor Tile, 9" x 9" light brown with white w/ black mastic	Second floor, room 218	Misc.
30	Stair tread, black	Stairway S-002	N/A
31	Floor Tile, 12" x 12" white with black w/ black mastic	Stairway S-002	Misc.
32	Window Glazing, gray exterior	All exterior windows	Misc.
33	Mortar, gray patch	Exterior of the building	N/A
34	Roof Flashing	Roof	Misc.
35	Roofing, built-up	Roof	N/A
36	Roofing Shingles, with black felt	Roof	N/A
37	Pipe Fitting Insulation, gray with cloth wrap	Crawl space	N/A
38	Pipe Fitting Insulation, with black mastic	Crawl space	N/A
39	Soil, light brown	Crawl space	N/A
40	Debris, from pipe insulation	Not identified during re-inspection	N/A
41	Mastic, yellow on gray rubber mats	First floor, room 112	N/A
42	Flexible Duct Connector, white	First floor, room 112	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.

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 763.85). 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	180-001, 180-002, 180-1-1	Mortar, gray	NAD	N/A
2	180-003, 180-004, 180-2-1	Plaster, gray	NAD	N/A
3	180-005, 180-006, 180-3-1	Floor Tile, 12" x 12" beige w/ brown mastic	NAD	N/A
4	180-007, 180-008, 180-4-1	Mastic, brown on cove base	NAD	N/A
5	N/A	Caulking, yellow/brown	N/A	N/A
6	180-011, 180-012, 180-6-1	Caulking, white	NAD	N/A
7	180-013, 180-014	Floor Tile, 9" x 9" dark brown w/ black mastic	27% chrysotile	Non
8	180-015, 180-016, 180-8-1	Mastic, black on cove base	NAD	N/A
9	180-017, 180-018	Pipe Insulation, white with cloth wrap	10% chrysotile, 40% amosite	Friable
10	180-019, 180-020, 180-10-1	Mortar, gray	NAD	N/A
11	180-021, 180-022, 180-11-1	Terrazzo, gray	NAD	N/A
12	180-023, 180-024, 180-12-1	Ceiling Tile, 2' x 2', white with long grooves	NAD	N/A
13	180-025, 180-026, 180-13-1	Grouting, gray on ceramic tile	NAD	N/A
14	180-027, 180-028, 180-14-1	Grouting, white on ceramic tile	NAD	N/A
15	180-029, 180-030, 180-15-1	Pipe Fitting Insulation, white with cloth wrap	NAD	N/A
16	N/A	Drywall, with white joint mud and tape	N/A	N/A
17	180-033, 180-034, 180-17-1	Grouting, gray on ceramic tile	NAD	N/A
18	180-035, 180-036,	Floor Tile, 12" x 12" cream w/	NAD	N/A

HA No.	Sample ID No.	Suspect Material Description	Asbestos Content	Friability
	180-18-1	brown mastic		
19	180-037, 180-038	Mastic, on red rubber floor mats	N/A	N/A
20	180-039, 180-040	Mastic, on gray rubber floor mats	N/A	N/A
21	180-041, 180-042, 180-21-1	Flexible Duct Connector, gray	NAD	N/A
22	180-043, 180-044, 180-22-1	Duct Joint Sealer, white	NAD	N/A
23	180-045, 180-046, 180-23-1	Duct Joint Sealer, green/black	NAD	N/A
24	180-047, 180-048, 180-24-1	Ceiling Tile, 1' x 1' gray	NAD	N/A
25	180-049, 180-050, 180-25-1	Floor Tile, 12" x 12" white with gray w/ brown mastic	NAD	N/A
26	180-051, 180-052, 180-26-1	Grouting, gray on ceramic tile	NAD	N/A
27	180-053, 180-054, 180-27-1	Ceiling Tile, 2' x 2' white with short grooves	NAD	N/A
28	180-055, 180-056, 180-28-1	Drywall, white with vinyl cover	NAD	N/A
29	180-057, 180-058, 180-29-1	Floor Tile, 9" x 9" light brown with white w/ black mastic	2% chrysotile	Non
30	180-059, 180-060, 180-30-1	Stair tread, black	NAD	N/A
31	180-061, 180-062	Floor Tile, 12" x 12" white with black w/ black mastic	5% chrysotile	Non
32	180-063, 180-064	Window Glazing, gray exterior	2% chrysotile	Friable
33	180-065, 180-066, 180-33-1	Mortar, gray patch	NAD	N/A
34	180-067, 180-068	Roof Flashing	3% chrysotile	Non
35	180-069, 180-070, 180-35-1	Roofing, built-up	NAD	N/A
36	180-071, 180-072	Roofing Shingles, with black felt	NAD	N/A
37	180-073, 180-074	Pipe Fitting Insulation, gray with cloth wrap	NAD	N/A
38	180-075, 180-076	Pipe Fitting Insulation, with black mastic	NAD	N/A
39	180-077, 180-078, 180-39-1	Soil, light brown	NAD	N/A
40	N/A	Debris, from pipe insulation	N/A	N/A
41	180-081, 180-082, 180-41-1	Mastic, yellow on gray rubber mats	NAD	N/A
42	180-083, 180-084, 180-42-1	Flexible Duct Connector, white	NAD	N/A

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

7.0 RESULTS OF QUALITY CONTROL SAMPLING

BAT collected and analyzed the samples identified in Table 5.0 for two purposes, one, to bring the existing survey into compliance with the NESHAP requirement that a minimum of three negative sample analyses is needed to categorize a material as being a non-asbestos-containing material, and two, for quality control. The purpose of quality control (QC) sampling was to ensure reproducibility of the primary laboratory analysis results.

Table 5.0
Validation of Quality Control Sampling

Sample I.D. No.	Primary Laboratory Analysis Results	QC Laboratory Analysis Results
BAT180-3-1QC	NAD	NAD
BAT180-4-1QC	NAD	NAD
BAT180-8-1QC	NAD	NAD
BAT180-11-1QC	NAD	NAD
BAT180-15-1QC	NAD	NAD
BAT180-24-1QC	NAD	NAD
BAT180-26-1QC	NAD	NAD
BAT180-29-1QC	NAD	NAD
BAT180-30-1QC	NAD	NAD
BAT180-33-1QC	NAD	NAD
BAT180-35-1QC	NAD	NAD

Notes: QC = Quality Control NAD = No Asbestos Detected

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 763.85.

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 180

SAMPLE NUMBER(S): 180-017 and 180-018

HOMOGENEOUS AREA No.: 9

TYPE OF MATERIAL: Surfacing TSI Other

Description: Pipe Insulation, white with cloth wrap

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 325 LF

CONDITION:

Percent Damage: 1-2 % 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: None identified.

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 included in the facility Operations and Maintenance (O&M) Plan until removal is accomplished.

PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-057 and 180-058

HOMOGENEOUS AREA No.: 29

TYPE OF MATERIAL: Surfacing TSI X Other

Description: Floor Tile, 9" x 9" light brown with white w/ black mastic

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 20 SF

CONDITION:

Percent Damage: <1 % Damage Localized Distributed

Type of Damage: Deterioration Water Physical

DESCRIPTION:

Overall Rating: X Good Fair Poor

POTENTIAL FOR DISTURBANCE:

Frequency of Potential Contact: X High Moderate Low

Description: Material is located in high traffic areas.

Influence of Vibration: High Moderate X Low

Description: None identified.

Potential for Air Erosion: High Moderate X Low

Description: None identified.

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

COMMENTS: Material should be included in the facility Operations and Maintenance (O&M) Plan.

PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-063 and 180-064

HOMOGENEOUS AREA No.: 32

TYPE OF MATERIAL: Surfacing TSI Other

Description: Window Glazing, gray exterior

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 3,160 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: Material is located outside.

Influence of Vibration: High Moderate Low

Description: Weathering.

Potential for Air Erosion: High Moderate Low

Description: Weathering.

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

COMMENTS: Material should be included in the facility Operations and Maintenance (O&M) Plan.

PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-067 and 180-068

HOMOGENEOUS AREA No.: 34

TYPE OF MATERIAL: Surfacing TSI Other

Description: Roof Flashing

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

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 on the roof.

Influence of Vibration: High Moderate Low

Description: Weathering.

Potential for Air Erosion: High Moderate Low

Description: Weathering.

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

COMMENTS: Material should be included in the facility Operations and Maintenance (O&M) Plan until removal is accomplished.

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.

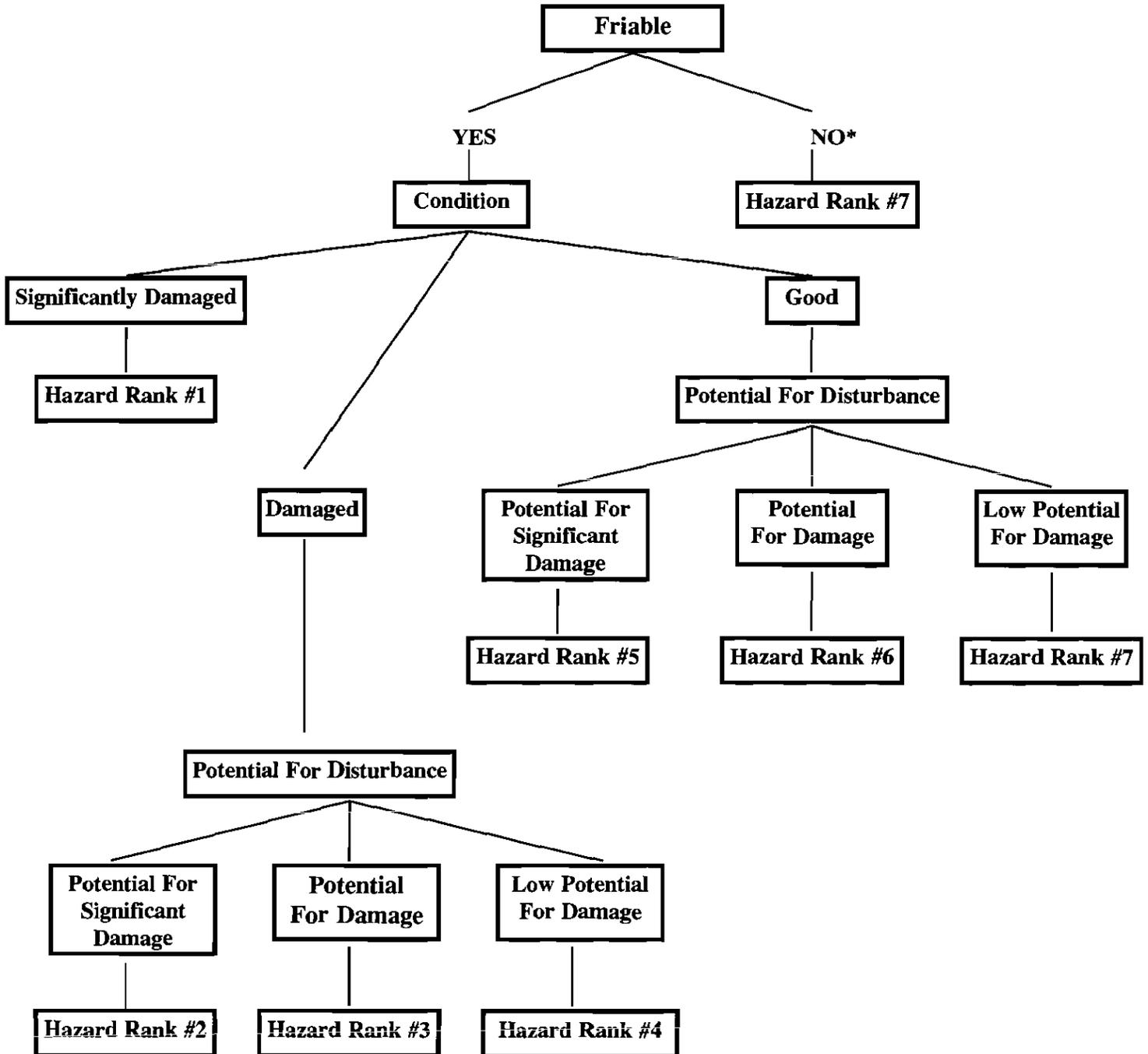
BAT adopted for this re-inspection one of the four general classes of hazard assessment models considered during the AHERA rule-making process. This method for hazard assessment is a modified decision tree as detailed in the USEPA, *Guidance for Assessing and Managing Exposure to Asbestos in Buildings*, 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 180

SAMPLE NUMBER(S): 180-013 and 180-014

HOMOGENEOUS AREA No.: 7

TYPE OF MATERIAL: Surfacing TSI X Other

Description: Floor Tile, 9" x 9" dark brown w/ black mastic

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 7,890 SF

Approximate Recommended Response Action Cost:

HAZARD ASSESSMENT

RESPONSE ACTION RECOMMENDATION

- | | |
|--|---|
| (1) Significantly damaged | (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 | <u>X</u> (5) Operations and Maintenance Program |
| (6) ACM (good condition) with potential for damage | |
| (7) Any remaining friable ACM or friable suspect ACM | |
| <u>X</u> (8) Non-friable ACM | |

COMMENTS: None.

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

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-017 and 180-018

HOMOGENEOUS AREA No.: 9

TYPE OF MATERIAL: Surfacing TSI Other

Description: Pipe Insulation, white with cloth wrap

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 325 LF

Approximate Recommended Response Action Cost:

HAZARD ASSESSMENT

RESPONSE ACTION RECOMMENDATION

- | | |
|--|--|
| (1) Significantly damaged | (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 | <input checked="" type="checkbox"/> (4) Repair |
| <input checked="" type="checkbox"/> (5) ACM (good condition) with potential for significant damage | <input checked="" type="checkbox"/> (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: This material should be removed prior to renovation and/or demolition.

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

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-57 and 180-058

HOMOGENEOUS AREA No.: 29

TYPE OF MATERIAL: Surfacing TSI Other

Description: Floor tile, 9" x 9" light brown with white w/ black mastic

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 20 SF

Approximate Recommended Response Action Cost:

HAZARD ASSESSMENT

RESPONSE ACTION RECOMMENDATION

- | | |
|--|--|
| (1) Significantly damaged | (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 | <input checked="" type="checkbox"/> (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: None.

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

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-061 and 180-062

HOMOGENEOUS AREA No.: 31

TYPE OF MATERIAL: Surfacing TSI Other

Description: Floor Tile, 12" X 12" white with black w/ black mastic

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 200 SF

Approximate Recommended Response Action Cost:

HAZARD ASSESSMENT

RESPONSE ACTION RECOMMENDATION

- | | |
|--|--|
| (1) Significantly damaged | (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 | <input checked="" type="checkbox"/> (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: None.

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

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-63 and 180-064

HOMOGENEOUS AREA No.: 32

TYPE OF MATERIAL: Surfacing TSI Other

Description: Window Glazing, gray exterior

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 3,160 LF

Approximate Recommended Response Action Cost:

HAZARD ASSESSMENT

RESPONSE ACTION RECOMMENDATION

- | | |
|--|---|
| <input checked="" type="checkbox"/> (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 | |
| (8) Non-friable ACM | |

COMMENTS: None.

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

BUILDING: Charleston Naval Shipyard, Building Number 180

SAMPLE NUMBER(S): 180-067 and 180-068

HOMOGENEOUS AREA No.: 34

TYPE OF MATERIAL: Surfacing TSI Other

Description: Roof Flashing

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

Approximate Recommended Response Action Cost:

HAZARD ASSESSMENT

RESPONSE ACTION RECOMMENDATION

- | | |
|--|--|
| (1) Significantly damaged | (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 | <input checked="" type="checkbox"/> (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: This material should be removed prior to renovation and/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 180. 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.

Material Description	Unit Cost (\$)	Quantity	Total Abatement Cost (\$)
Floor Tile	1.78	8,110 SF	14,436
Pipe Insulation	8.21	325 LF	2,668
Window Glazing	2.35	3,160 LF	7,426
Roof Flashing	6.23	300 SF	1,869
Handling Cost	25.00	66 EA	1,650
Mobilization	300.00	3 EA	900
Waste Disposal Cost	<u>50.00</u>	<u>51 CY</u>	<u>2,550</u>
Removal Subtotal			31,499
IH Supervision and Monitoring			<u>3,750</u>
Project Subtotal			35,249
Contingency (46%)			<u>16,215</u>
Project Total			51,464

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

11.0 CONCLUSIONS

Inspection of Building 180 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" dark brown w/ black mastic	7,890 SF	Category I, non-friable
Pipe Insulation, white with cloth wrap	325 LF	Regulated, friable
Floor Tile, 9" x 9" light brown with white w/ black mastic	20 SF	Category I, non-friable
Floor Tile, 12" x 12" white with black w/ black mastic	200 SF	Category I, non-friable
Window Glazing, gray exterior	3,160 LF	Regulated, friable
Roof Flashing	300 SF	Category I, non-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>
--------------------	-----------------	------------------------

None.

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.

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.

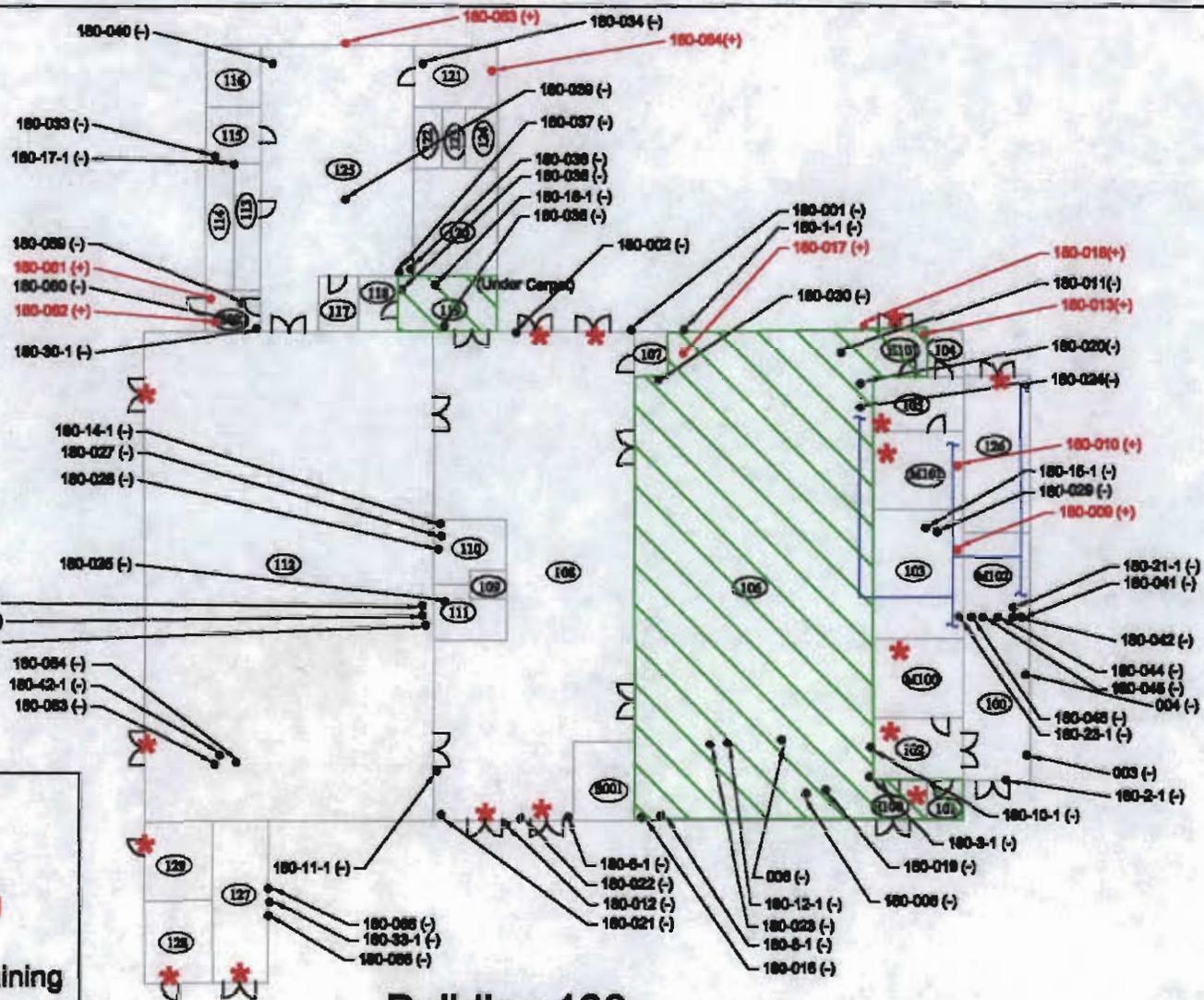
APPENDIX A

SAMPLE AND ACM LOCATION DRAWINGS

Note: All Window Glazing on Exterior Windows Contains Asbestos

Legend

- - Sample Location
- (+) - Asbestos-Containing Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- (101) - Inspector-Assigned Room Number
- * - Asbestos-Containing Caulking Around Doors
-  - Asbestos-Containing Floor Tile and Mastic
-  - Asbestos-Containing Pipe and Pipe Fitting Insulation



Building 180

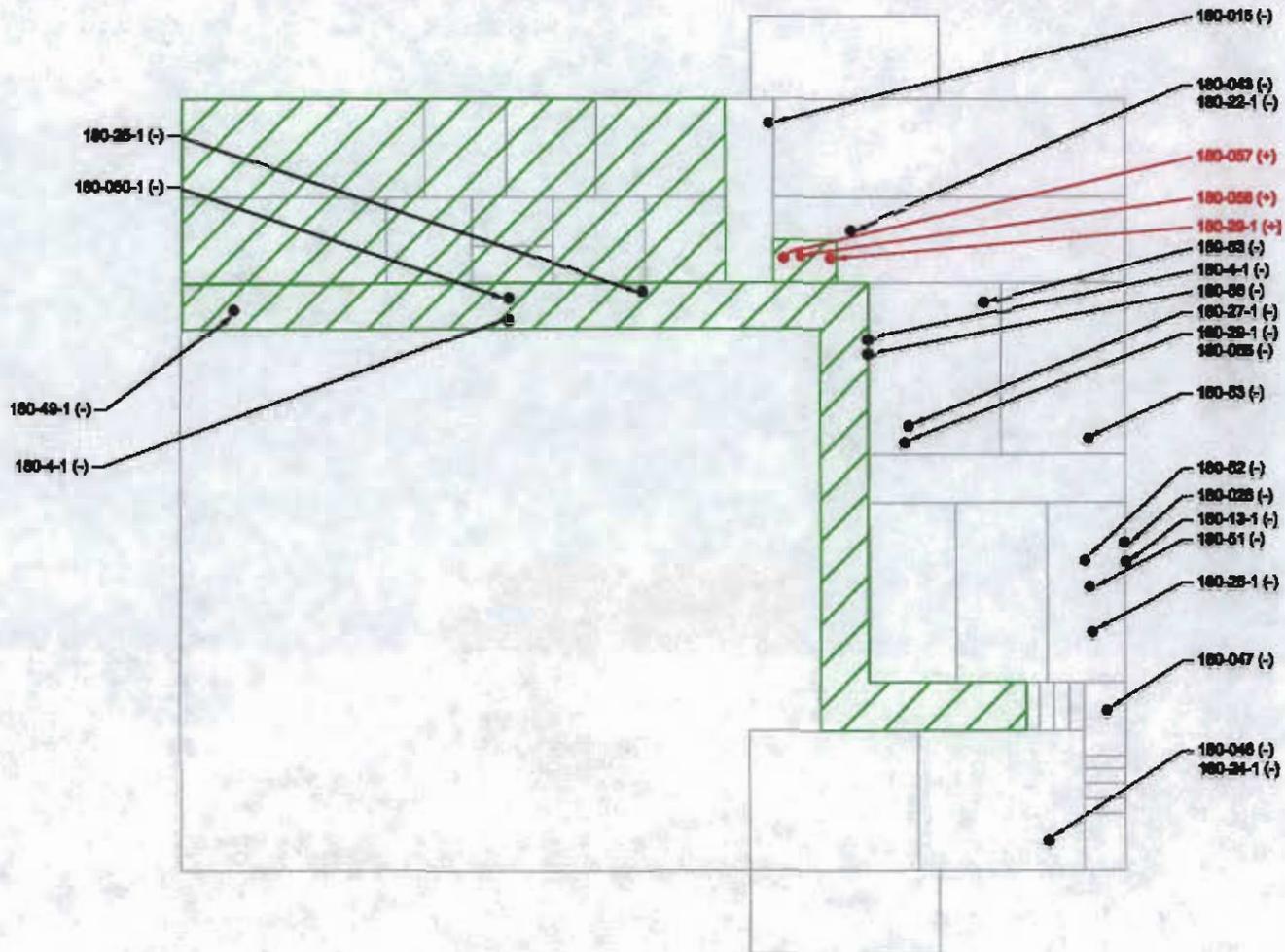
Floor 1

Sample and Asbestos-Containing Material Locations

NOT TO SCALE

BAT Associates, Inc.

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



Legend

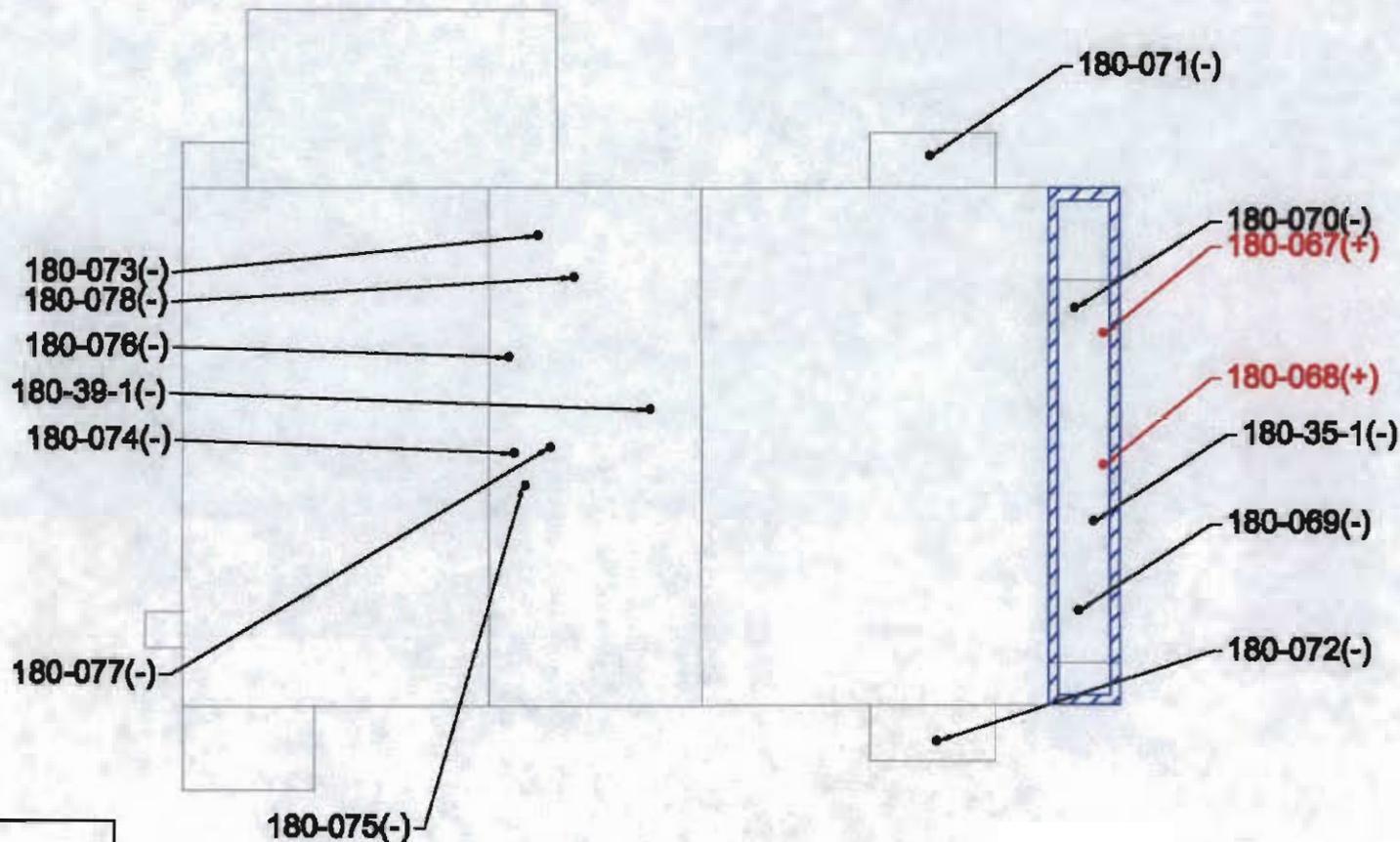
- - Sample Location
- (+) - Asbestos-Containing Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- Asbestos-Containing Floor Tile and Mastic

Building 180
 Second Floor
 Sample and Asbestos-Containing
 Material Locations



NOT TO SCALE

BAT Associates, Inc.
 ENVIRONMENTAL, HEALTH & SAFETY SERVICES
 5151 BROOK HOLLOW PARKWAY, SUITE 250
 NORCROSS, GA 30071



Legend

- - Sample Location
- (+) - Asbestos-Containing Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- (101) - Inspector-Assigned Room Number
-  - Asbestos-Containing Roof Flashing



Building 180 Roof

Sample and Asbestos-Containing
Material Locations

NOT TO SCALE

BAT Associates, Inc.

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

APPENDIX B
PHOTOGRAPHIC DOCUMENTATION
OF IDENTIFIED ACM



Floor Tile, 9" x 9" dark brown w/ black mastic, HA # 7



Pipe Insulation, white with cloth wrap, HA # 9



Floor Tile, 9" x 9" light brown with white w/ black mastic, HA # 29



Floor Tile, 12" x 12" white with black w/ black mastic, HA # 31



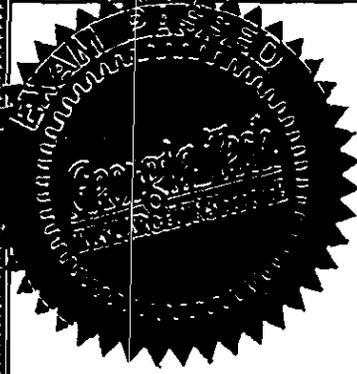
Window Glazing, gray exterior, HA # 32



Roof Flashing, HA # 34

APPENDIX C

PERSONNEL AND LABORATORY ACCREDITATIONS



The Georgia Institute of Technology

This is to certify that

Foshie Bell

has attended an EPA-approved half-day Continuing Education Course entitled:

**Inspecting Buildings for Asbestos Containing Materials
(Annual Refresher Course for Building Inspectors)**

as required by the Federal EPA AHERA Model Accreditation Plan for
re-accreditation as a Building Inspector for Asbestos (TSCA Title II).

Georgia Tech Research Institute
Electro-Optics, Environment and Materials Laboratory
Atlanta, GA 30332
Phone: (404) 894-7430; FAX: (404) 894-1267

August 26, 1998

Dates of Attendance

August 26, 1999

Expiration Date

149-64-0385

Social Security Number

Myrtle I. Turner, CET
Course Director

2900

Certificate Number

The Environmental Institute

Douglas J. Milton

Social Security Number - 266-55-7179

*Has completed coursework and satisfactorily passed
an examination that meets all criteria required for
EPA/AHERA/ASHARA (TSCA Title II) Approved Reccreditation
and NESHAP Regulations Training*

***Asbestos in Buildings: Inspector & Management
Planner Refresher***

December 15, 1999

Course Date

6398

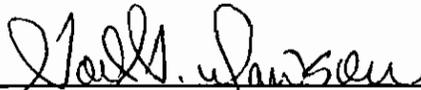
Certificate Number

December 15, 1999

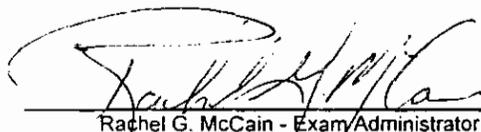
Examination Date

December 14, 2000

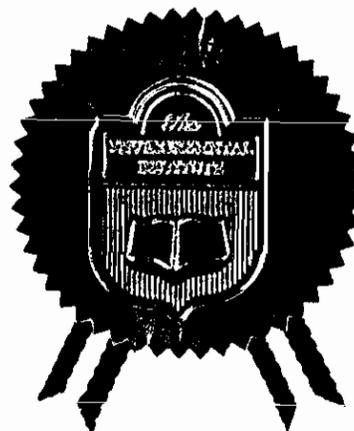
Expiration Date



Tod A. Dawson - Course Director

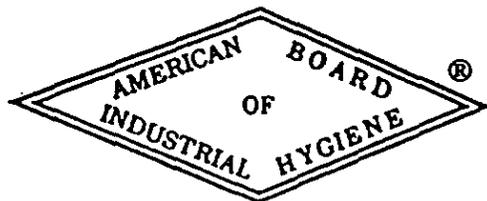


Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600

The
American Board of Industrial Hygiene®
ABIH®



organized to improve the practice of Industrial Hygiene
proclaims that

Douglas J. Milton

having met all requirements through
education, experience and examination,
is hereby certified in the

**COMPREHENSIVE PRACTICE
of
INDUSTRIAL HYGIENE**

and has the right to use the designations

CERTIFIED INDUSTRIAL HYGIENIST

CIH

November 12, 1997

date

J. Kenneth Conner

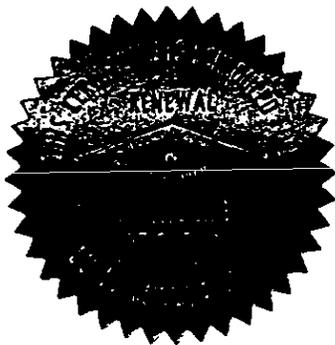
Chair ABIH

CP 7612

certificate
number

Regina Conner

Secretary ABIH





ASBESTOS ABATEMENT LICENSE

No. 22860

This certifies that

Douglas J Milton

266-AB-7179

doing business as *B A T Associates, Inc*

has satisfactorily completed the training required by South Carolina Regulation No. 61-86.1 and the EPA Model Accreditation Plan, 40 CFR 763 Subpart E Appendix C, for the category of

Consultant/Management Planner

The holder of this license shall comply with all the requirements of said Regulation.

This License, License Number, or any Representation thereof, is not transferable to any other licensee or company. Use of this License is only authorized for the licensee and Company whose name appears hereon and shall expire one year from

09/24/98.

The holder of this license is qualified in accordance with requirements of the Asbestos Hazard Emergency Response Act of 1986 (AHERA) to perform as an abatement Building Inspector.

07/28/99

Richard D. Sharpe

ORIGINAL

07/28/99 14:31



Richard D. Sharpe, Director
Air Compliance Management Division
Bureau of Air Quality
South Carolina Department of Health & Environmental Control

CR-001126



ASBESTOS ABATEMENT LICENSE

No. 22859

This certifies that

Douglas J Milton

266-BI-7179

doing business as *B A T Associates, Inc*

has satisfactorily completed the training required by South Carolina Regulation No. 61-86.1 and the EPA Model Accreditation Plan, 40 CFR 763 Subpart E Appendix C, for the category of

Consultant/Building Inspector

The holder of this license shall comply with all the requirements of said Regulation.

This License, License Number, or any Representation thereof, is not transferable to any other licensee or company. Use of this License is only authorized for the licensee and Company whose name appears hereon and shall expire one year from

09/23/98.

07/28/99

Richard D. Sharpe

ORIGINAL

07/28/99 14:28



Richard D. Sharpe, Director
Air Compliance Management Division
Bureau of Air Quality
South Carolina Department of Health & Environmental Control

CR-001126

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation



CAPE ENVIRONMENTAL MANAGEMENT, INC.
ATLANTA, GA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

BULK ASBESTOS FIBER ANALYSIS

June 30, 2000

Effective through

A handwritten signature in black ink, appearing to read "James L. Galt".

For the National Institute of Standards and Technology

NVLAP Lab Code: 102111-0

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation



ANALYTICAL ENVIRONMENTAL SERVICES, INC.
ATLANTA, GA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

BULK ASBESTOS FIBER ANALYSIS

September 30, 2000

Effective through

A handwritten signature in black ink, appearing to read "James L. Galt".

For the National Institute of Standards and Technology

NVLAP Lab Code: 102033-0

APPENDIX D

LABORATORY ANALYSIS RESULTS



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

AES Job Number: **B212**
 Page 104 of 183 Total Samples
 Wednesday, February 09, 2000



BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc.
 Project Name: Charleston Naval Shipyard Project Number: 971001
 Client Sample ID: 180-1-1 AES Lab ID: 3474
 Location: Not given

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	40
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	3	Glue:	
Animal Hair:		Binders:	57
Antigorite:			

COMMENTS: Paint included as binder.

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 105 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:	3475
Client Sample ID:	180-2-1		
Location:	Not given		

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	
NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	2
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	40
Styrofoam:	
OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	58

COMMENTS: Paint included as binder.

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 Number: 971001
 Project Name: Charleston Naval Shipyard AES Lab ID: 3476
 Client Sample ID: 180-3-1
 Location: Not given

Sample Description: Tan hard compact partly granular with fibers and glue.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	45
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:	1	Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	3
Animal Hair:		Binders:	50
Antigorite:			

COMMENTS:

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Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

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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: 3477
 Client Sample ID: 180-4-1
 Location: Not given

Sample Description: Brown semi-hard resilient with fibers and glue.

All percentages given below are visually estimated by volume

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

NON-ASBESTOS FIBERS	
Synthetics:	1
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	90
Glue:	3
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:

Andrew Pittman

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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: 3478
 Client Sample ID: 180-6-1
 Location: Not given

Sample Description: Gray semi-hard silty with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:	5	Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:		Glue:	
Animal Hair:		Binders:	95
Antigorite:			

COMMENTS: Paint included as binder.

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: *S. Arkhipov*
 Svetlana Arkhipov

QCAlyst: *Andrew Pittman*
 Andrew Pittman

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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: 3479
 Client Sample ID: 180-8-1
 Location: Not given

Sample Description: Black semi-hard resilient to partly granular with fibers and glue.

All percentages given below are visually estimated by volume

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

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	20
Styrofoam:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	70
Glue:	3
Binders:	6

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: *S. Arkhipov*
 Svetlana Arkhipov

QCAlyst: *Andrew Pittman*
 Andrew Pittman

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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: 3480
 Client Sample ID: 180-10-1
 Location: Not given

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

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

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	30
Styrofoam:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	69

COMMENTS: Paint included as binder.

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: *S. Arkhipov*
 Svetlana Arkhipov

QCAlyst: *Andrew Pittman*
 Andrew Pittman

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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: 3481
 Client Sample ID: 180-11-1
 Location: Not given

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	30
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	
Animal Hair:		Binders:	69
Antigorite:			

COMMENTS: Paint included as binder.

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 Number: 971001
 Project Name: Charleston Naval Shipyard AES Lab ID: 3482
 Client Sample ID: 180-12-1
 Location: Not given

Sample Description: Gray soft fibrous to perlitic with paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	30
Tremolite:		Aggregates:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:	35	Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	25	Glue:	
Animal Hair:		Binders:	10
Antigorite:			

COMMENTS: Paint included as binder.

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

QCAnalyst:

Andrew Pittman

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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: 3483
 Client Sample ID: 180-13-1
 Location: Not given

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	20
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	
Animal Hair:		Binders:	79
Antigorite:			

COMMENTS: Paint included as binder.

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 Number: 971001
 Project Name: Charleston Naval Shipyard AES Lab ID: 3484
 Client Sample ID: 180-14-1
 Location: Not given

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	45
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	
Animal Hair:		Binders:	54
Antigorite:			

COMMENTS: Paint included as binder.

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Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

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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: 3485
 Client Sample ID: 180-15-1
 Location: Not given

Sample Description: Pink semi-hard woven to silty with paint.

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:	80	Resilient Material:	
Cellulose:		Glue:	
Animal Hair:		Binders:	20
Antigorite:			

COMMENTS: Paint included as binder.

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
 Client Sample ID: 180-17-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3486

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

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

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	30
Styrofoam:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	69

COMMENTS: Paint included as binder.

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: *S. Arkhipov*
 Svetlana Arkhipov

QCAlyst: *Andrew Pittman*
 Andrew Pittman

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BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc.
 Project Name: Charleston Naval Shipyard
 Client Sample ID: 180-18-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3487

Sample Description: Brown hard compact partly granular with fibers, glue and bitumen.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	10
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	1
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	45
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	3
Resilient Material:	
Glue:	2
Binders:	38

COMMENTS: Floor tile contains 10% chrysotile. Bitumen and glue do 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: *S. Arkhipov*
 Svetlana Arkhipov

QCAnalyst: *Andrew Pittman*
 Andrew Pittman

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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: 3488
 Client Sample ID: 180-21-1
 Location: Not given

Sample Description: Black semi-hard resilient to woven.

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:	50	Resilient Material:	50
Cellulose:		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

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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: 3489
 Client Sample ID: 180-22-1
 Location: Not given

Sample Description: Yellow soft fibrous with aluminum.

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:	5
Mineral Wool:		Bitumen:	
Fiberglass:	90	Resilient Material:	
Cellulose:	5	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

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BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc.
 Project Name: Charleston Naval Shipyard
 Client Sample ID: 180-23-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3490

Sample Description: Black semi-hard resilient to woven.

All percentages given below are visually estimated by volume

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

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

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	50
Glue:	
Binders:	

COMMENTS:

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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
 Client Sample ID: 180-24-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3491

Sample Description: Dark brown soft fibrous with paint.

All percentages given below are visually estimated by volume

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

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

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	90
Cellulose:	
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	10

COMMENTS: Paint included as binder.

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
 Client Sample ID: 180-25-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3492

Sample Description: Gray hard compact partly granular with fibers and glue.

All percentages given below are visually estimated by volume

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

NON-ASBESTOS FIBERS	
Synthetics:	1
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	45
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	3
Binders:	50

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 Number: 971001
 Project Name: Charleston Naval Shipyard AES Lab ID: 3493
 Client Sample ID: 180-26-1
 Location: Not given

Sample Description: Gray semi-hard partly granular with fibers and paint.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	25
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	
Animal Hair:		Binders:	74
Antigorite:			

COMMENTS: Paint included as binder.

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

QCAnalyst:

Andrew Pittman

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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: 3494
 Client Sample ID: 180-27-1
 Location: Not given

Sample Description: Gray soft fibrous to perlitic with paint.

All percentages given below are visually estimated by volume

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

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	35
Fiberglass:	
Cellulose:	25
Animal Hair:	
Antigorite:	

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	30
Aggregates:	
Styrofoam:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	10

COMMENTS: Paint included as binder.

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
 Client Sample ID: 180-28-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3495

Sample Description: Layered: 1) Brown soft fibrous with paint; 2) Tan semi-hard silty with fibers.

All percentages given below are visually estimated by volume

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

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

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	25
Animal Hair:	
Antigorite:	

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

COMMENTS: Paint included as binder.

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: *S. Arkhipov*
 Svetlana Arkhipov

QCAlyst: *Andrew Pittman*
 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: 180-29-1 AES Lab ID: 3496
 Location: Not given

Sample Description: Gray hard compact partly granular with fibers and glue.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	45
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:	1	Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	3
Animal Hair:		Binders:	50
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

QCAnalyst:
 Andrew Pittman

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BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc.
 Project Name: Charleston Naval Shipyard
 Client Sample ID: 180-30-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3497

Sample Description: Brown to black semi-hard mastic with fibers.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	<1
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	80
Binders:	19

COMMENTS:

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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
 Client Sample ID: 180-33-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3498

Sample Description: Black to gray semi-hard resilient with fibers.

All percentages given below are visually estimated by volume

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

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

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	90
Glue:	
Binders:	9

COMMENTS:

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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
 Client Sample ID: 180-35-1
 Location: Not given
 Project Number: 971001
 AES Lab ID: 3499

Sample Description: 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:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	60
Fiberglass:		Resilient Material:	
Cellulose:	40	Glue:	
Animal Hair:		Binders:	
Antigorite:			

COMMENTS:

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Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

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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: 3500
 Client Sample ID: 180-39-1
 Location: Not given

Sample Description: Dark brown semi-hard silty with fibers and iron oxide.

All percentages given below are visually estimated by volume

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

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

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	97

COMMENTS: Iron oxide included as binder.

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:

Andrew Pittman

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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: 3501
 Client Sample ID: 180-41-1
 Location: Not given

Sample Description: Light brown semi-hard vacuous with fibers and paint.

All percentages given below are visually estimated by volume

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

NON-FIBROUS MATERIALS	
Vermiculite:	
Biotite:	
Mica:	
Perlite:	
Aggregates:	
Styrofoam:	85

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	
Cellulose:	1
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	14

COMMENTS:

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Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

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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: 3502
 Client Sample ID: 180-42-1
 Location: Not given

Sample Description: Light brown soft 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:	90	Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:		Glue:	
Animal Hair:		Binders:	10
Antigorite:			

COMMENTS:

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Microanalyst:

Svetlana Arkhipov

QCAlyst:

Andrew Pittman

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BAT

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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. 180-1-1		16. 180-22-1	
2. 180-2-1		17. 180-23-1	
3. 180-3-1		18. 180-24-1	
4. 180-4-1		19. 180-25-1	
5. 180-6-1		20. 180-26-1	
6. 180-8-1		21. 180-27-1	
7. 180-10-1		22. 180-28-1	
8. 180-11-1		23. 180-29-1	
9. 180-12-1		24. 180-30-1	
10. 180-13-1		25. 180-33-1	
11. 180-14-1		26. 180-35-1	
12. 180-15-1		27. 180-39-1	
13. 180-17-1		28. 180-41-1	
14. 180-18-1		29. 180-42-1	
15. 180-21-1		30.	
SPECIAL INSTRUCTIONS: <i>Analyze each homogeneous area till positive</i>			
Relinquished by: <i>Josh Bell</i>		Received by: <i>Jenny Ross</i>	
Date: <i>1/31/00</i>	Time: <i>1357</i>	Date: <i>FEB 01 2000</i>	Time:

2/1/00 NAVY BILL RATE

**ENVIRONMENTAL
MANAGEMENT
INC**

TEL: (770) 908-7200 FAX: (770) 908-7219

PLM ANALYSIS ASBESTOS SUMMARY *

CLIENT NAME: **BAT ASSOCIATES** PROJECT NO: **00003.000.000**
 PROJECT NAME: **CHARLESTON NSY / 871001-13.03** LAB JOB NO: **B0018** DATE RCVD: **2/1/00**

SAMPLE LAB ID	SAMPLE FIELD ID	LAYER NUMBER	APPEARANCE	LOCATION / DESCRIPTION	% ASBESTOS (COMMENTS)
32 1044	1385-4-1QC		BLACK SOFT BITUMINOUS TO FIBROUS		-
33 1045	BAT180-11-1QC		GRAY HARD CEMENTITIOUS TO GRANULAR		-
34 1046	BAT180-3-1QC		GRAY HARD RESILIENT TO GRANULAR WITH BLACK MASTIC		-
35 1047	BAT180-33-1QC		BLACK SOFT RESILIENT WITH AGGREGATES AND PAINT		-
36 1048	BAT180-35-1QC		BLACK SOFT BITUMINOUS TO FIBROUS		-
37 1049	BAT180-30-1QC		BLACK SOFT RESILIENT		-
38 1050	BAT180-15-1QC		YELLOW SOFT FIBROUS WITH PAINT-MUD		-
39 1051	BAT180-26-1QC		GRAY HARD RESILIENT TO GRANULAR WITH MASTIC		-
40 1052	BAT180-4-1QC		BROWN SEMI-HARD RESILIENT		-
41 1053	BAT180-8-1QC		BLACK SEMI-HARD RESILIENT WITH WHITE MASTIC		-
42 1054	BAT180-9-1QC		GRAY HARD RESILIENT TO GRANULAR WITH YELLOW MASTIC		-
43 1055	BAT180-24-1QC		YELLOW SOFT FIBROUS WITH PAINT		-
44 1056	BAT8-14-1QC		BROWN HARD SILTY MASTIC		-
45 1057	BAT199-14-1QC		DUPLICATE COC ENTRY. SEE LAB REPORT #1042		(NOT ANALYZED)
46 1058	BAT6-1-1QC		GRAY POWDERY TO GRANULAR		-
47 1059	33-4-1QC		BLUE HARD RESILIENT TO GRANULAR WITH GLUE		-
48 1060	86-1-1QC		GREEN HARD RESILIENT TO GRANULAR WITH BLACK MASTIC		6%CHR (NO ASBESTOS DETECTED IN BLACK MASTIC)

* If box "QC" is not checked, these results are provided before full QC is completed and therefore could be changed.

QC

"-" = NO ASBESTOS DETECTED

BAT

BAT Associates, Inc.
 ENVIRONMENTAL, HEALTH & SAFETY SERVICES

5151 Brook Hollow Pkwy., Suite 250
 Norcross, GA 30071
 Phone: (770) 242-3908
 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. 1777-1-1QC		16. BAT6-1QC	
2. 1385-4-0C		17. 33-4-1QC	
3. BAT180-11-1QC		18. 86-1-1QC	
4. BAT180-3-1QC		19. 86-2-1QC	
5. BAT180-33-1QC		20. 86-3-1QC	
6. BAT180-35-1QC		21. 86-4-1QC	
7. BAT180-30-1QC		22. 86-9-1QC	
8. BAT180-15-1QC		23. 86-15-1QC	
9. BAT180-26-1QC		24. 86-22-1QC	
10. BAT180-4-1QC		25. 86-24-1QC	
11. BAT180-8-1QC		26.	
12. BAT180-29-1QC		27.	
13. BAT180-24-1QC		28.	
14. BAT8-14-1QC		29.	
15. BAT199-17-1QC		30.	
SPECIAL INSTRUCTIONS:			
Relinquished by: <i>John Bell</i>		Received by: <i>[Signature]</i>	
Date: 12/29/99	Time:	Date: 2/1/00	Time: 2:30

2/1/00