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ASBESTOS-CONTAINING MATERIAL RE-INSPECTION FOR BUILDING NS46 VOLUME 9
CNC CHARLESTON SC
2/15/2000
BAT ASSOCIATES, INC.

Volume 9

**Asbestos-Containing Material Re-inspection
For Building NS46
Charleston Naval Shipyard
Charleston, South Carolina**

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

Prepared for:

Department of the Navy
Southern Division
NAVFACENCOM
2305 Eagle Drive
North Charleston, SC 29419

Prepared by:

BAT Associates, Inc.
5151 Brook Hollow Parkway
Suite 250
Norcross, Georgia 30071
(770) 242-3908

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 NS46 located at the Charleston Naval Shipyard (CNS) in Charleston, South Carolina.

A list of ACM identified in Building NS46 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	Spray-Applied Textured Finish, on concrete	3-30% chrysotile	2,625 SF	Category I, non-friable
14	Caulking, gray	3% chrysotile	1,500 LF	Category I, non-friable
15	Mastic, black behind gray grouting on brown wall tile	3% chrysotile	140 SF	Category I, non-friable
16	Mastic, black behind white grouting on brown wall tile	2-3% chrysotile	140 SF	Category I, non-friable

NOTES: HA = Homogeneous Area SF = Square Feet EA = Each

1. One percent or less asbestos content is considered a non-asbestos-containing material by EPA and the State of South Carolina.
2. 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.
3. No Quality Control discrepancies were noted.

BAT recommends the following management actions for the identified ACM in Building NS46 in Table 2.0.

Table 2.0
Recommended Response Actions

HA No.	Material Description	Recommended Response Action
7	Spray-Applied Textured Finish, on concrete	Removal Prior to Renovation or Demolition
14	Caulking, gray	O&M Plan
15	Mastic, black behind gray grouting on brown wall tile	O&M Plan
16	Mastic, black behind white grouting on brown wall tile	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 NS46 is approximately \$43,900. 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: NS46
Facility: Charleston Naval Shipyard
Building Area (square footage): 48,115
Year Built: 1958
Building Type: Vacant
No. of Floors in Building: Two
Purpose of ACM Survey: Re-Inspection
Facility Unit Identification Code (UIC): N/A

Building Contact: Mr. Gary Crawford
Contact's Telephone No.: (843) 200-3187
Building Survey Date(s): January 28, 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 NS46.

This re-inspection survey was performed by Mr. Foshie Bell, under the direct supervision of Mr. Douglas J. Milton, CIH, on January 28, 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 NS46.

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, beige with brown marble w/ brown mastic	Rooms 112, 122, 125, 133, H-100, H-101, and H-102	N/A
2	Sheet Flooring, speckled		N/A
3	Mastic, brown on cove base	Rooms H-100 and H-102	N/A
4	Caulking, white	Not identified during re-inspection	N/A
5	Glazing, white	Room H-102 and exterior the building	N/A
6	Mortar, gray on exterior brick	Rooms 148, 149, H-100 and the exterior of the building	N/A
7	Spray-Applied Textured Finish, on concrete	Exterior porticos of the building	Surfacing
8	Plaster, white	Exterior porticos of the building	Surfacing
9	Mortar, gray on cinder block	Majority of rooms throughout the building	N/A
10	Drywall, on walls and ceilings	Majority of rooms throughout the building	N/A
11	Ceiling Tile, 2' x 4' white with pinholes	Majority of rooms throughout the building	N/A
12	Mastic, gray on vent duct	Majority of rooms throughout the building	N/A
13	Ceiling Tile, 2' x 4' white with long grooves	Rooms 124, 130, 140, 157, 167, 168, 200, 202, 205, E-001, H-101, H-102, H-104, H-200, and H-201	N/A
14	Caulking, gray	Exterior building and in rooms 103, 147, E-003, and H-201	Misc.
15	Mastic, black behind gray grouting on brown wall tile	Rooms 105 and 108	Misc.
16	Mastic, black behind white grouting on brown wall tile	Rooms 105 and 106	Misc.
17	Floor Tile, white with dimples w/ black mastic	Removed	N/A
18	Floor Tile, tan w/ black mastic	Removed	N/A
19	Ceiling Tile, 2' x 4' white with crows feet	Rooms E-005 and H-102	N/A
20	Floor Tile, beige with brown and white marbling w/ brown mastic	Rooms 113 and 145	N/A
21	Mastic, black, on floor tile	Removed	N/A
22	Mastic, white on vent duct	Rooms 116, 117, 118, 124, and E-001	N/A
23	Sealer, black on windows	Room 116	N/A

HA No.	Description of Suspect ACM	Location of Suspect ACM	AHERA Category of Material
24	Sheet Flooring, cream color	Room 125 (under HA# 1)	N/A
25	Grouting, gray on gray tile	Rooms 126, 135, 155, 162, and 207	N/A
26	Grouting, white on blue-green tile	Rooms 126 and 135	N/A
27	Grouting, gray on blue tile	Rooms 128 and 136	N/A
28	Grouting, white on white tile	Rooms 128 and 163	N/A
29	Grouting, gray on red quarry tile	Rooms 134, 137, H-200, and H-201	N/A
30	Grouting, gray on gray tile	Rooms 134, 137, H-200 and H-201	N/A
31	Mastic, black on vent duct	Removed	N/A
32	Pipe Fitting Insulation, white	Rooms 145, 155, 161, 163, 168, 169, 201, 207, 209, E-004, H-104, H-201, and the exterior of the building	N/A
33	Floor tile, orange with speckles w/ black mastic	Removed	N/A
34	Floor Tile, white w/ black mastic	Removed	N/A
35	Floor Tile, green w/ black mastic	Removed	N/A
36	Floor Tile, white w/ black mastic	Rooms 146, 147, 158, 202, 203, 204, and 205	N/A
37	Floor Tile, blue	Rooms 150 and 153	N/A
38	Floor Tile, chocolate with brown and white marbling	Room 150 (under HA# 37)	N/A
39	Grouting, gray on gray tile	Rooms 161 and 163	N/A
40	Floor Tile, dark green with white marbling	Room E-005	N/A
41	Floor Tile, light green with green marbling	Rooms 164, 165, and E-005	N/A
42	Floor Tile, black w/ black mastic	Removed	N/A
43	Floor Tile, brown w/ black mastic	Removed	N/A
44	Pipe Insulation, white	Room 169	N/A
45	Tank Insulation, white	Room 169	N/A
46	Floor Tile, green with white marbling w/ black mastic	Removed	N/A
47	Floor Tile, gray with white marbling w/ black mastic	Removed	N/A
48	Floor Tile, white with gray marbling w/ black mastic	Removed	N/A
49	Floor Tile, pea green w/ black mastic	Removed	N/A
50	Mastic, black on stair treads	Room S-002	N/A
51	Floor Tile, gray with black marbling w/ black mastic	Removed	N/A
52	Mastic, black and brown on vent duct insulation	Rooms 200, 202, 203, 204, 205, 206, and H-201	N/A
54	Ceiling Tile, 2' x 4' white with big holes	Rooms 203, 204, and 206	N/A
55	Pipe Insulation, white	Removed	N/A

HA No.	Description of Suspect ACM	Location of Suspect ACM	AHERA Category of Material
56	Grouting, gray on green tile	Removed	N/A
57	Grouting, white on green tile	Room 209	N/A
58	Roofing, black tar and felt	Roof	N/A
59	Flashing Sealer Material, gray and black	Room 209	N/A
60	Pipe Insulation, yellow	Room R-100	N/A
61	Pipe Fitting Insulation, yellow	Room R-100	N/A
62	Roofing, black composition sheet	Room R-103	N/A
63	Roofing, black composition sheet	Rooms R-105 and R-107	N/A
64	Pipe Insulation, white	Removed	N/A
65	Pipe Fitting Insulation, white	Removed	N/A
66	Debris, white pipe insulation	Removed	N/A
67	Soil, brown	Removed	N/A
68	Pipe Fitting Insulation, white	Removed	N/A
69	Pipe Insulation, black mastic wrap	Removed	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	NS46-001, NS46-002, NS46-003, NS46-004, NS46-005	Floor Tile, beige with brown marble w/ brown mastic	NAD	N/A
2	NS46-006, NS46-007, NS46-008	Sheet Flooring, speckled	NAD	N/A

HA No.	Sample ID No.	Suspect Material Description	Asbestos Content	Friability
3	NS46-009, NS46-010, BAT46-3-1	Mastic, brown on cove base	NAD	N/A
4	N/A	Caulking, white	N/A	N/A
5	NS46-013, NS46-014, NS46-015, NS46-016, NS46-017	Glazing, white	NAD	N/A
6	NS46-018, NS46-019, BAT46-6-1	Mortar, gray on exterior brick	NAD	N/A
7	NS46-020, NS46-021, NS46-022, NS46-023, NS46-024, NS46-025, NS46-026	Spray-Applied Textured Finish, on concrete	3-30% chrysotile	Non
8	NS46-027, NS46-028, NS46-029, NS46-030, NS46-031, NS46-032, NS46-033	Plaster, white	NAD	Non
9	NS46-034, NS46-035, BAT46-9-1	Mortar, gray on cinder block	NAD	N/A
10	NS46-036, NS46-037, NS46-038, NS46-039, NS46-040, NS46-041, NS46-042	Drywall, on walls and ceilings	NAD	N/A
11	NS46-043, NS46-044, NS46-045, NS46-046, NS46-047, NS46-048, NS46-049	Ceiling Tile, 2' x 4' white with pinholes	NAD	N/A
12	NS46-050, NS46-051, BAT46-12-1	Mastic, gray on vent duct	NAD	N/A
13	NS46-052, NS46-053, NS46-054, NS46-055, NS46-056, NS46-057, NS46-058	Ceiling Tile, 2' x 4' white with long grooves	NAD	N/A
14	NS46-059, NS46-060	Caulking, gray	3% chrysotile	Non
15	NS46-061, NS46-062, BAT46-15-1	Mastic, black behind gray grouting on brown wall tile	3% chrysotile	Non
16	NS46-063, NS46-064, BAT46-16-1	Mastic, black behind white grouting on brown wall tile	2-3% chrysotile	Non
17	N/A	Floor Tile, white with dimples w/ black mastic	N/A	N/A
18	N/A	Floor Tile, tan w/ black mastic	N/A	N/A
19	NS46-075, NS46-076, NS46-077	Ceiling Tile, 2' x 4' white with crows feet	NAD	N/A
20	NS46-078, NS46-079, NS46-080	Floor Tile, beige with brown and white marbling w/ brown mastic	NAD	N/A
21	N/A	Mastic, black, on floor tile	N/A	N/A
22	NS46-083, NS46-084, BAT46-22-1	Mastic, white on vent duct	NAD	N/A
23	NS46-085, NS46-086, BAT46-23-1	Sealer, black on windows	NAD	N/A

HA No.	Sample ID No.	Suspect Material Description	Asbestos Content	Friability
24	NS46-087, NS46-088, NS46-089	Sheet Flooring, cream color	NAD	N/A
25	NS46-090, NS46-091, BAT46-25-1	Grouting, gray on gray tile	NAD	N/A
26	NS46-092, NS46-093, BAT46-26-1	Grouting, white on blue-green tile	NAD	N/A
27	NS46-094, NS46-095, BAT46-27-1	Grouting, gray on blue tile	NAD	N/A
28	NS46-096, NS46-097, BAT-28-1	Grouting, white on white tile	NAD	N/A
29	NS46-098, NS46-099, BAT-29-1	Grouting, gray on red quarry tile	NAD	N/A
30	NS46-100, NS46-101, BAT-30-1	Grouting, gray on gray tile	NAD	N/A
31	N/A	Mastic, black on vent duct	N/A	N/A
32	NS46-104, NS46-105, NS46-106, NS46-107, NS46-108, NS46-109, NS46-110, NS46-111, NS46-112, NS46-113	Pipe Fitting Insulation, white	NAD	N/A
33	N/A	Floor tile, orange with speckles w/ black mastic	N/A	N/A
34	N/A	Floor Tile, white w/ black mastic	N/A	N/A
35	N/A	Floor Tile, green w/ black mastic	N/A	N/A
36	NS46-125, NS46-126, NS46-127	Floor Tile, white w/ black mastic	NAD	N/A
37	NS46-128, NS46-129, NS46-130	Floor Tile, blue	NAD	N/A
38	NS46-131, NS46-132, NS46-133	Floor Tile, chocolate with brown and white marbling	NAD	N/A
39	NS46-134, NS46-135, BAT46-39-1	Grouting, gray on gray tile	NAD	N/A
40	NS46-136, NS46-137, NS46-138	Floor Tile, dark green with white marbling	NAD	N/A
41	NS46-139, NS46-140, NS46-141	Floor Tile, light green with green marbling	NAD	N/A
42	N/A	Floor Tile, black w/ black mastic	N/A	N/A
43	N/A	Floor Tile, brown w/ black mastic	N/A	N/A
44	NS46-148, NS46-149, NS46-150	Pipe Insulation, white	NAD	N/A
45	NS46-151, NS46-152, NS46-153	Tank Insulation, white	NAD	N/A
46	N/A	Floor Tile, green with white marbling w/ black mastic	N/A	N/A
47	N/A	Floor Tile, gray with white marbling w/ black mastic	N/A	N/A
48	N/A	Floor Tile, white with gray marbling w/ black mastic	N/A	N/A
49	N/A	Floor Tile, pea green w/ black mastic	N/A	N/A

HA No.	Sample ID No.	Suspect Material Description	Asbestos Content	Friability
50	NS46-68, NS46-69, BAT46-50-1	Mastic, black on stair treads	NAD	N/A
51	N/A	Floor Tile, gray with black marbling w/ black mastic	N/A	N/A
52	NS46-171, NS46-172, BAT46-52-1	Mastic, black and brown on vent duct insulation	NAD	N/A
54	NS46-173, NS46-174, NS46-175	Ceiling Tile, 2' x 4' white with big holes	NAD	N/A
55	N/A	Pipe Insulation, white	N/A	N/A
56	NS46-180, NS46-181, BAT46-56-1	Grouting, gray on green tile	NAD	N/A
57	NS46-182, NS46-183, BAT-57-1	Grouting, white on green tile	NAD	N/A
58	NS46-184, NS46-185, BAT46-58-1	Roofing, black tar and felt	NAD	N/A
59	NS46-186, NS46-187, BAT59-1	Flashing Sealer Material, gray and black	NAD	N/A
60	NS46-188, NS46-189, NS46-190	Pipe Insulation, yellow	NAD	N/A
61	NS46-191, NS46-192, NS46-193	Pipe Fitting Insulation, yellow	NAD	N/A
62	NS46-194, NS46-195, BAT46-62-1	Roofing, black composition sheet	NAD	N/A
63	NS46-196, NS46-197, BAT46-63-1	Roofing, black composition sheet	NAD	N/A
64	N/A	Pipe Insulation, white	N/A	N/A
65	N/A	Pipe Fitting Insulation, white	N/A	N/A
66	N/A	Debris, white pipe insulation	N/A	N/A
67	NS46-204, NS46-205	Soil, brown	NAD	N/A
68	N/A	Pipe Fitting Insulation, white	N/A	N/A
69	N/A	Pipe Insulation, black mastic wrap	N/A	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
BAT46-3-1QC	NAD	NAD
BAT46-9-1QC	NAD	NAD
BAT46-12-1QC	NAD	NAD
BAT46-15-1QC	NAD	NAD
BAT46-16-1QC	2% chrysotile	Layer 1 = NAD, Layer 2 = 3% chrysotile*
BAT46-22-1QC	NAD	NAD
BAT46-23-1QC	NAD	NAD
BAT46-25-1QC	NAD	NAD
BAT46-26-1QC	NAD	NAD
BAT46-27-1QC	NAD	NAD
BAT46-28-1QC	NAD	NAD
BAT46-29-1QC	NAD	NAD
BAT46-30-1QC	NAD	NAD
BAT46-39-1QC	NAD	NAD
BAT46-50-1QC	NAD	NAD
BAT46-52-1QC	NAD	NAD
BAT46-56-1QC	NAD	NAD
BAT46-57-1QC	NAD	NAD
BAT46-58-1QC	NAD	NAD
BAT46-62-1QC	NAD	NAD
BAT46-63-1QC	NAD	NAD

Notes: QC = Quality Control NAD = No Asbestos Detected

No discrepancies between primary 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 NS46

SAMPLE NUMBER(S): NS46-020, NS46-021, NS46-022, NS46-023, NS46-024, NS46-025, and NS46-026

HOMOGENEOUS AREA No.: 7

TYPE OF MATERIAL: Surfacing TSI Other

Description: Spray-Applied Textured Finish, on concrete

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 2,625 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 ceiling of high traffic areas.

Influence of Vibration: High Moderate Low

Description: Material is located on the porticos outside the building.

Potential for Air Erosion: High Moderate Low

Description: Material is located on the porticos outside the building.

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 NS46

SAMPLE NUMBER(S): NS46-059 and NS46-060

HOMOGENEOUS AREA No.: 14

TYPE OF MATERIAL: Surfacing TSI Other

Description: Caulking, gray

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 1,500 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 around exterior doors.

Influence of Vibration: High Moderate Low

Description: Vibration from the opening and closing of doors.

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.

PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM

BUILDING: Charleston Naval Shipyard, Building Number NS46

SAMPLE NUMBER(S): NS46-061, NS46-062, and BAT46-15-1

HOMOGENEOUS AREA No.: 15

TYPE OF MATERIAL: Surfacing TSI Other

Description: Mastic, black behind gray grouting on brown wall tile

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 140 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 behind wall tile.

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.

PHYSICAL ASSESSMENT DATA FOR IDENTIFIED ACM

BUILDING: Charleston Naval Shipyard, Building Number NS46

SAMPLE NUMBER(S): NS46-063, NS46-064, and BAT46-16-1

HOMOGENEOUS AREA No.: 16

TYPE OF MATERIAL: Surfacing TSI Other

Description: Mastic, black behind white grouting on brown wall tile

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 140 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 behind wall tile.

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.

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.

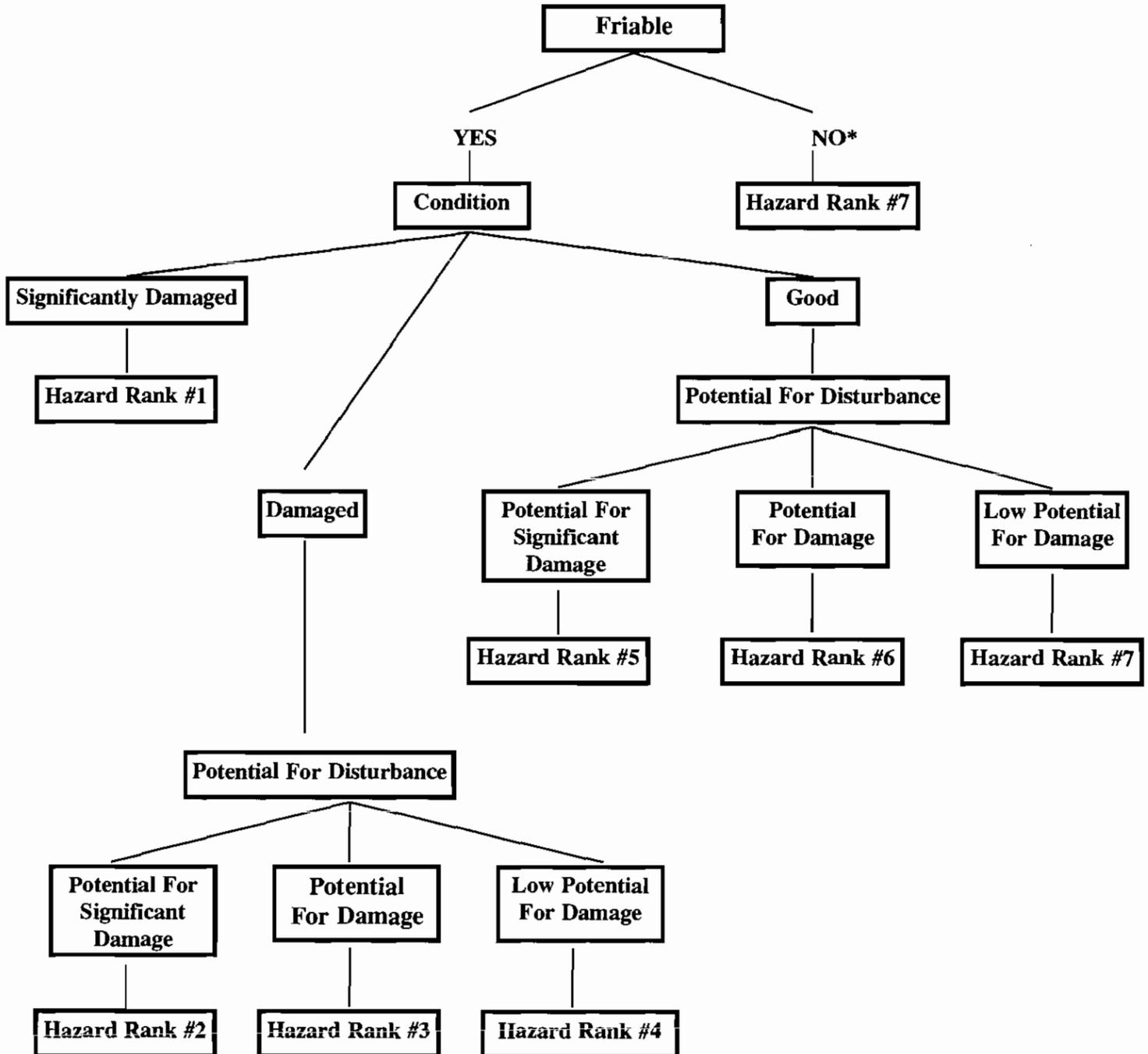
BAT adopted for this re-inspection one of the four general classes of hazard assessment models considered during the AHERA rule-making process. This method for hazard assessment is a modified decision tree as detailed in the USEPA, *Guidance for Assessing and Managing Exposure to Asbestos in Buildings*, 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 NS46

SAMPLE NUMBER(S): NS46-020, NS46-021, NS46-022, NS46-023, NS46-024, NS46-025, and NS46-026

HOMOGENEOUS AREA No.: 7

TYPE OF MATERIAL: Surfacing TSI Other

Description: Spray-Applied Textured Finish, on concrete

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 2,625 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 |
| <input checked="" type="checkbox"/> (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 NS46

SAMPLE NUMBER(S): NS46-59 and NS46-060

HOMOGENEOUS AREA No.: 14

TYPE OF MATERIAL: Surfacing TSI Other

Description: Caulking, gray

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 1,500 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 | (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 NS46

SAMPLE NUMBER(S): NS46-061, NS46-062, and BAT46-15-1

HOMOGENEOUS AREA No.: 15

TYPE OF MATERIAL: Surfacing TSI Other

Description: Mastic, black behind gray grouting on brown wall tile

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 140 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 NS46

SAMPLE NUMBER(S): NS46-063, NS46-064, and BAT46-16-1

HOMOGENEOUS AREA No.: 16

TYPE OF MATERIAL: Surfacing TSI X Other

Description: Mastic, black behind white grouting on brown wall tile

Approximate Amount of Asbestos-Containing Material (Linear or Square Foot): 140 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.

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 NS46. 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 (\$)
Spray-Applied Textured Finish and plaster, on concrete	7.23	2,625 SF	18,979
Mastic, behind wall tile	4.25	280 SF	1,190
Caulking, gray	2.76	1,500 LF	4,125
Handling Cost	25.00	28 EA	700
Mobilization	300.00	2 EA	600
Waste Disposal Cost	<u>50.00</u>	<u>16 CY</u>	<u>800</u>
 Removal Subtotal			 26,394
 IH Supervision and Monitoring			 <u>3,250</u>
 Project Subtotal			 29,644
 Contingency (48%)			 <u>14,229</u>
 Project Total			 43,873

SF = Square Feet EA = Each CY = Cubic Yard

11.0 CONCLUSIONS

Inspection of Building NS46 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>
Spray-Applied Textured Finish and plaster, on concrete	2,625 SF	Category I, non-friable
Caulking, gray	1,500 LF	Category I, non-friable
Mastic, black behind gray grouting on brown wall tile	140 SF	Category I, non-friable
Mastic, black behind white grouting on brown wall tile	140 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

NS46-204(-)

NS46-205(-)

NS46-203(-)

C100

Legend

- - Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- ⑩ - Inspector-Assigned Room Number

Building NS46 Basement

Asbestos-Containing Material
Sample Locations

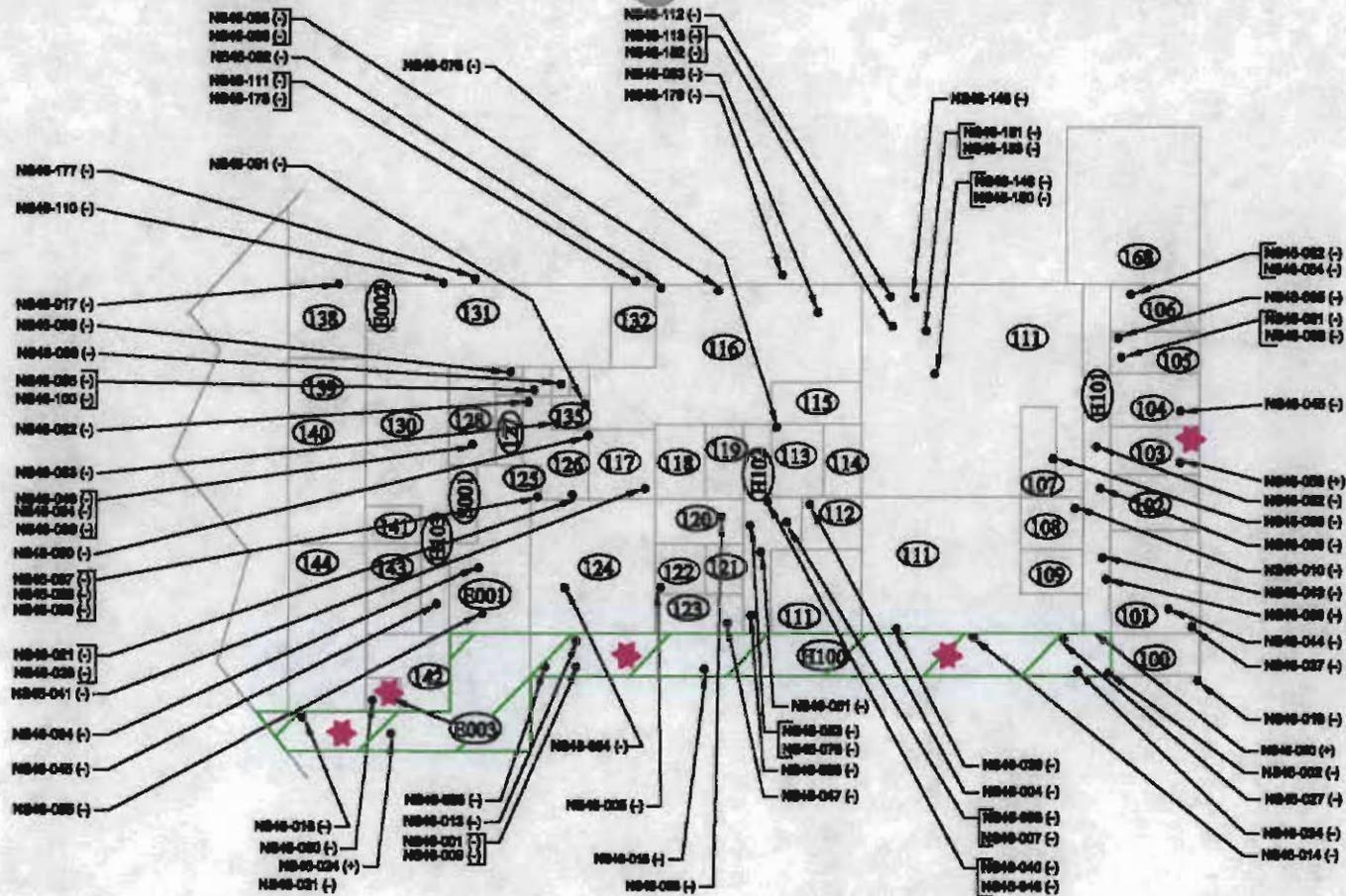


NOT TO SCALE

**NOTE: No Asbestos-Containing
Materials Identified in the Basement.**

BAT Associates, Inc.

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



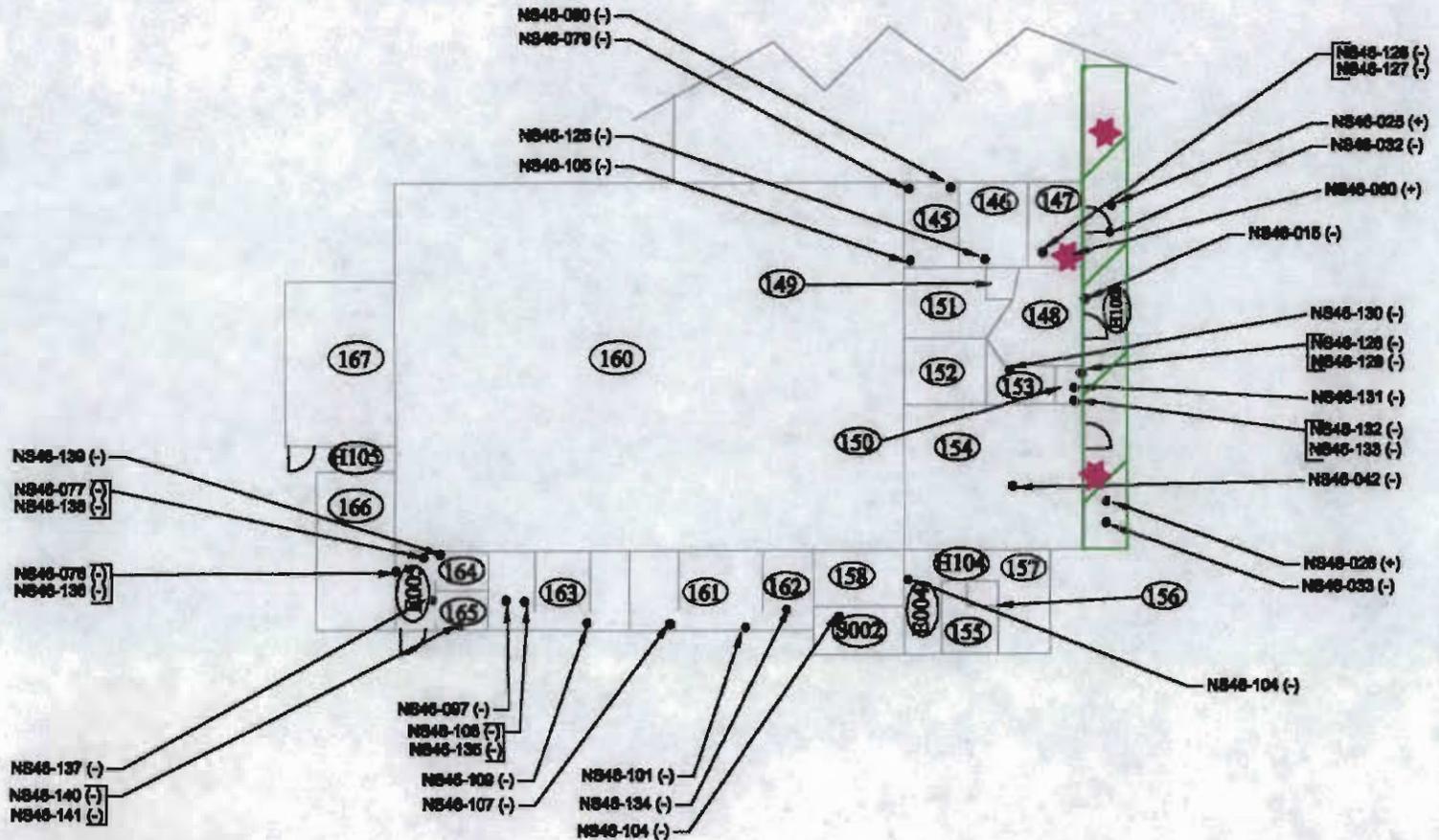
Legend

- - Sample Location
- (+) - Asbestos-Containing Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- (101) - Inspector-Assigned Room Number
- ★ - Room with Asbestos-Containing Gray Caulking
- ▭ - Asbestos-Containing Finish and Plaster on Ceiling

Building NS46
 First Floor - East
 Asbestos-Containing Material
 Sample Locations



NOT TO SCALE



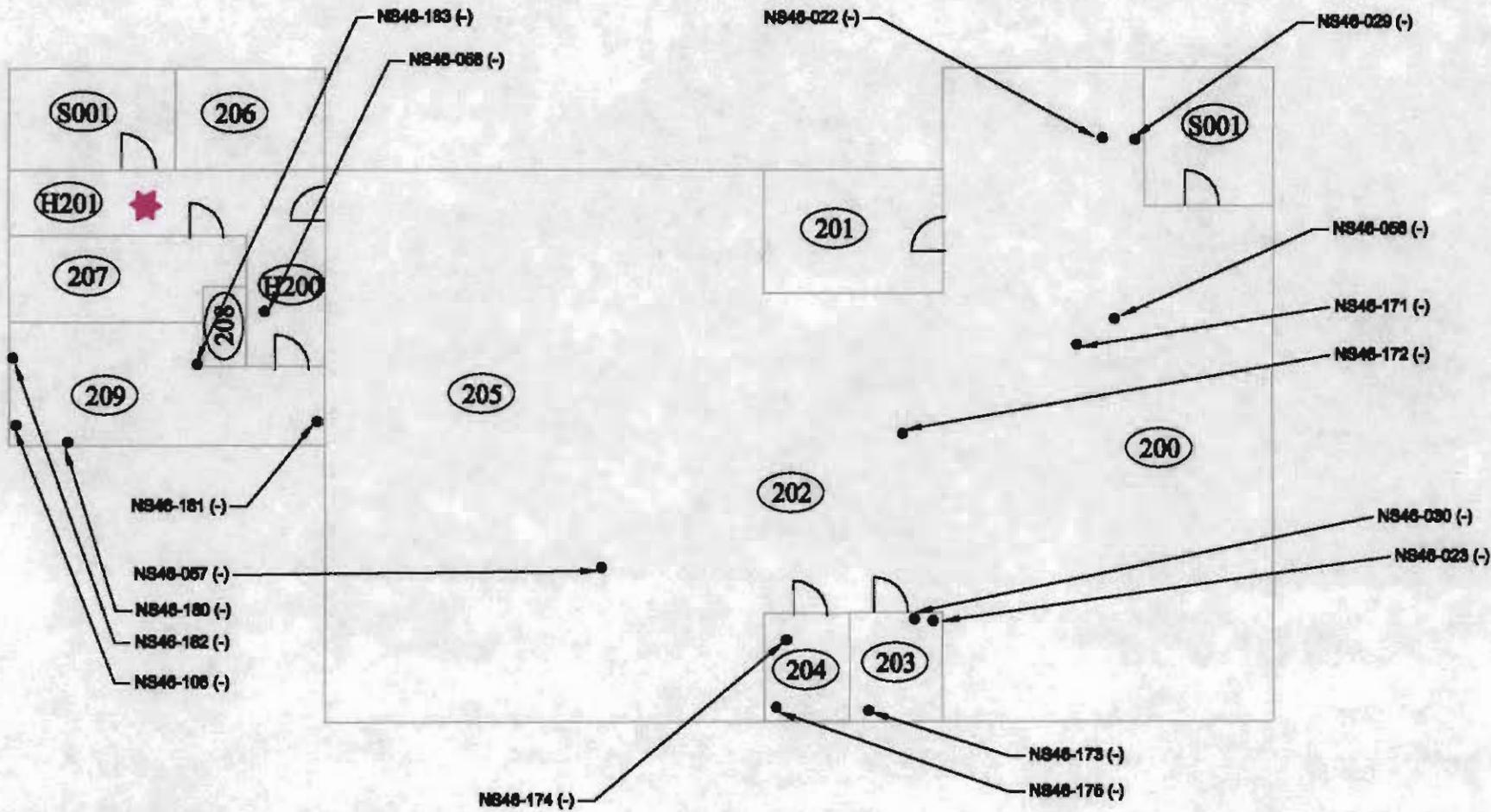
Legend

- - Sample Location
- (+) - Asbestos-Containing Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- (101) - Inspector-Assigned Room Number
-  - Asbestos-Containing Textured Finish and Plaster on Ceiling
-  - Room with Asbestos-Containing Gray Caulking

Building NS46
 First Floor - West
 Asbestos-Containing Material
 Sample Locations



NOT TO SCALE



Legend

- - Sample Location
- (+) - Asbestos-Containing Sample Location
- (-) - Non-Asbestos-Containing Sample Location
- (101) - Inspector-Assigned Room Number
- ★ - Room with Asbestos-Containing Gray Caulking

Building NS46
Second Floor
Asbestos-Containing Material
Sample Locations



NOT TO SCALE

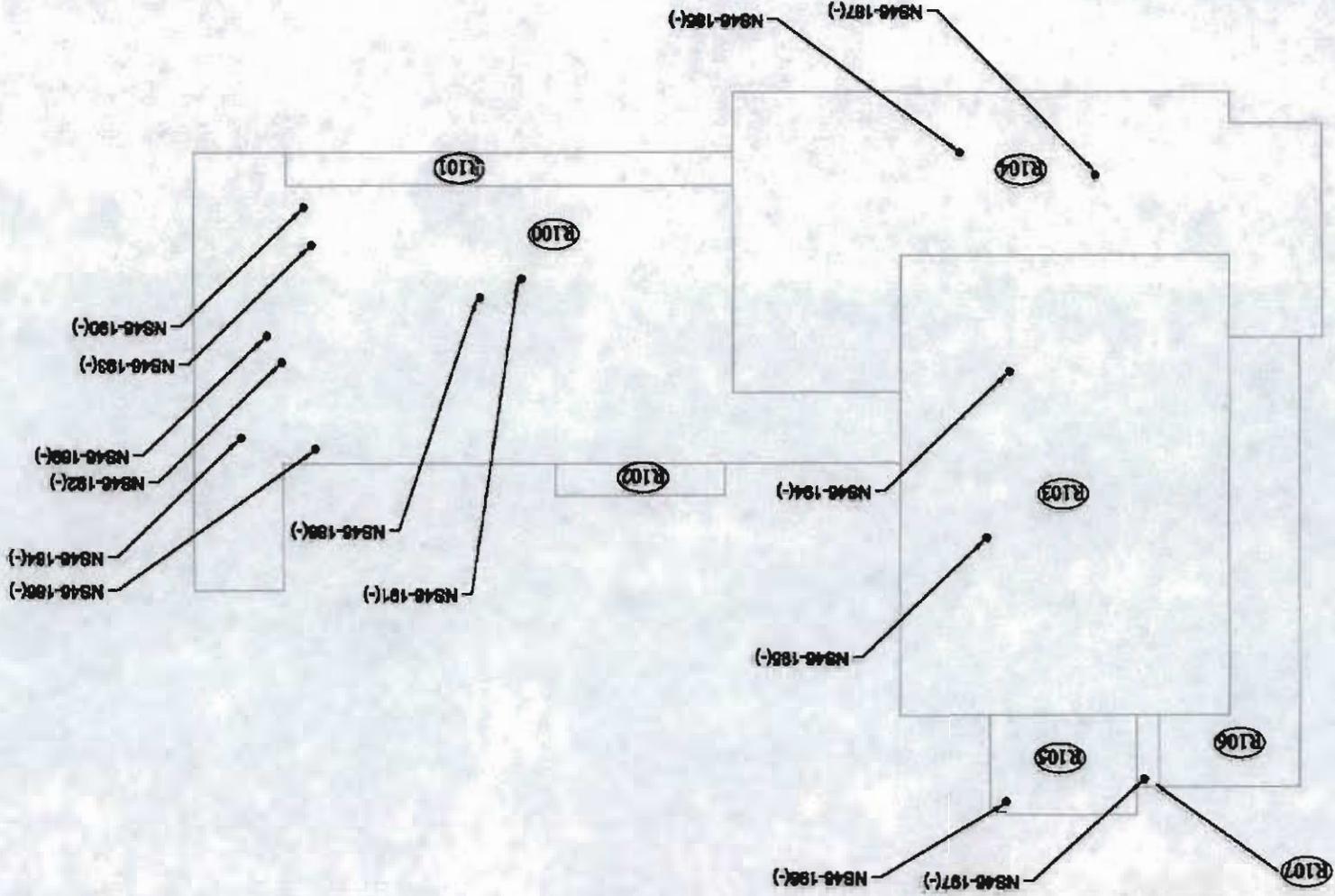
BAT Associates, Inc.
 ENVIRONMENTAL, HEALTH & SAFETY SERVICES
 5151 BROOK HOLLOW PARKWAY, SUITE 250
 NORCROSS, GA 30071

NOTE: No Asbestos-Containing Materials Identified on the Roof.

NOT TO SCALE

**Building NS46
 Roof
 Asbestos-Containing Material
 Sample Locations**

Legend	
•	- Sample Location
(+)	- Asbestos-Containing Sample Location
(-)	- Non-Asbestos-Containing Sample Location
(101)	- Inspector-Assigned Room Number



APPENDIX B
PHOTOGRAPHIC DOCUMENTATION
OF IDENTIFIED ACM



Spray-Applied Textured Finish and Plaster, on concrete, HA # 7

**PHOTOGRAPHIC DOCUMENTATION OF GRAY CAULKING AROUND EXTERIOR
DOORS OF THE BUILDING IS NOT AVAILABLE**

Caulking, gray, HA # 14

**PHOTOGRAPHIC DOCUMENTATION NOT AVAILABLE SINCE THE MATERIAL IS
LOCATED BEHIND BROWN CERAMIC WALL TILE IN RESTROOMS IN ROOMS 105
AND 108**

Mastic, black behind gray grouting on brown wall tile, HA # 15

**PHOTOGRAPHIC DOCUMENTATION NOT AVAILABLE SINCE THE MATERIAL IS
LOCATED BEHIND BROWN CERAMIC WALL TILE IN RESTROOMS IN ROOMS 105
AND 108**

Mastic, black behind white grouting on brown wall tile, HA # 16

APPENDIX C

PERSONNEL AND LABORATORY ACCREDITATIONS

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 Rec accreditation
and NESHAP Regulations Training*

*Asbestos in Buildings: Inspector & Management
Planner Refresher*

December 15, 1999

Course Date

6398

Certificate Number

December 15, 1999

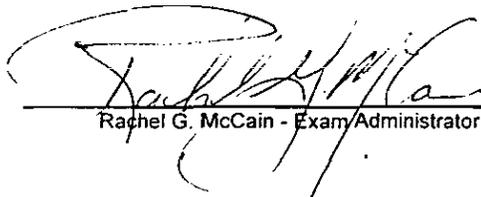
Examination Date

December 14, 2000

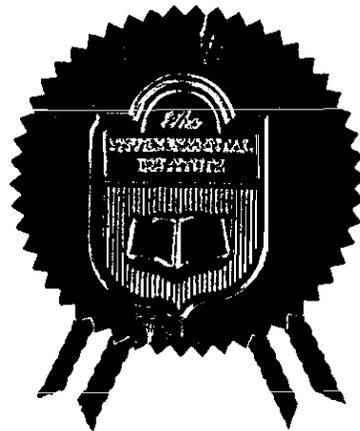
Expiration Date



Tod A. Dawson - Course Director

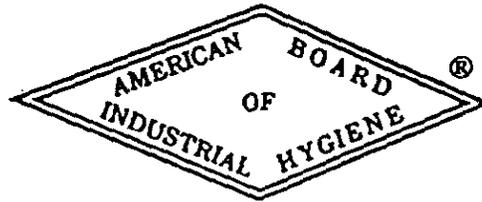


Rachel G. McCain - Exam Administrator



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

Robert Conner

Secretary ABIH



ASBESTOS ABATEMENT LICENSE

No. 22860

This certifies that

Douglas J Milton

266-MS-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-BSJ-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

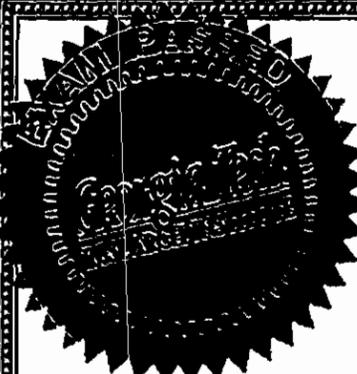
September 30, 2000

Effective through

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

For the National Institute of Standards and Technology

NVLAP Lab Code: 102033-0



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

Handwritten signature of Myrtle I. Turner in cursive script.

Myrtle I. Turner, CET
Course Director
2900

Certificate Number

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: B203
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 Thursday, February 10, 2000



BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc. Project Number: 971001
 Project Name: Charleston Naval Shipyard AES Lab ID: 3093
 Client Sample ID: BAT 46-9-1
 Location: Not Given

Sample Description: Gray hard silty to 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:	40
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	57

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: *Andrew Pittman*
 Andrew Pittman

QCAAnalyst: *S. Arkhipov*
 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:	3094
Client Sample ID:	BAT 46-12-1		
Location:	Not Given		

Sample Description: Brown soft fibrous with aluminum 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:	
Styrofoam:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	2
Fiberglass:	5
Cellulose:	50
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	33
Bitumen:	
Resilient Material:	
Glue:	5
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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3095
 Client Sample ID: BAT 46-15-1
 Location: Not Given

Sample Description: Yellow gummy with fibers and bitumen.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	3
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

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

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

OTHERS	
Aluminum:	
Bitumen:	30
Resilient Material:	
Glue:	60
Binders:	7

COMMENTS: Bitumen contains 10 % chrysotile. Glue does not contain asbestos.

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Microanalyst: *Andrew Pittman*
 Andrew Pittman

QCAAnalyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3096
 Client Sample ID: BAT 46-16-1
 Location: Not Given

Sample Description: Yellow gummy with fibers and bitumen.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	2
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	
Fiberglass:	<1
Cellulose:	2
Animal Hair:	
Antigorite:	

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

OTHERS	
Aluminum:	
Bitumen:	10
Resilient Material:	
Glue:	50
Binders:	36

COMMENTS: Bitumen contains 10 % 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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3097
 Client Sample ID: BAT 46-22-1
 Location: Not Given

Sample Description: Layered: 1) Tan semi-hard gummy to woven; 2) Brown soft fibrous with aluminum 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:	
Styrofoam:	

NON-ASBESTOS FIBERS	
Synthetics:	
Mineral Wool:	2
Fiberglass:	30
Cellulose:	10
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	30
Bitumen:	
Resilient Material:	
Glue:	3
Binders:	25

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: *Andrew Pittman*
 Andrew Pittman

QCAAnalyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3098
 Client Sample ID: BAT 46-23-1
 Location: Not Given

Sample Description: Gray semi-hard gummy 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:	<1
Cellulose:	2
Animal Hair:	
Antigorite:	

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	98

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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc.
 Project Name: Charleston Naval Shipyard
 Client Sample ID: BAT 46-25-1
 Location: Not Given
 Project Number: 971001
 AES Lab ID: 3099

Sample Description: Gray hard silty to partly granular 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:	40
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	59

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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3100
 Client Sample ID: BAT 46-26-1
 Location: Not Given

Sample Description: Layered: 1) Tan semi-hard silty with fibers and paint; 2) Gray hard compact silty to partly granular.

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:	5
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	94

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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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:	3101
Client Sample ID:	BAT 46-27-1		
Location:	Not Given		

Sample Description: Tan semi-hard silty 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:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	2	Glue:	
Animal Hair:		Binders:	98
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:

Andrew Pittman

Andrew Pittman

QCAlyst:

S. Arkhipov

Svetlana Arkhipov

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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: 3102
 Client Sample ID: BAT 46-28-1
 Location: Not Given

Sample Description: Off-white semi-hard silty 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:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	2	Glue:	
Animal Hair:		Binders:	98
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: *Andrew Pittman* QCAAnalyst: *S. Arkhipov*
 Andrew Pittman Svetlana Arkhipov

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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: 3103
 Client Sample ID: BAT 46-29-1
 Location: Not Given

Sample Description: Off-white semi-hard silty 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:	<1
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	98

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: *Andrew Pittman*
 Andrew Pittman

QCAAnalyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: BAT 46-30-1 AES Lab ID: 3104
 Location: Not Given

Sample Description: Gray hard compact silty to partly granular with fibers and bitumen.

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:	40
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	<1
Resilient Material:	
Glue:	
Binders:	59

COMMENTS: Bitumen is not enough to be analyzed.

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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3105
 Client Sample ID: BAT 46-50-1
 Location: Not Given

Sample Description: Green soft gummy 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:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	2
Animal Hair:		Binders:	97
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: *Andrew Pittman* QCAlyst: *S. Arkhipov*
 Andrew Pittman 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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 Fax: (770) 457-8188

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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: 3106
 Client Sample ID: BAT 46-39-1
 Location: Not Given

Sample Description: Gray soft resilient 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:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	95
Cellulose:	1	Glue:	
Animal Hair:		Binders:	4
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: *Andrew Pittman* QCAlyst: *S. Arkhipov*
 Andrew Pittman Svetlana Arkhipov

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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: 3107
 Client Sample ID: BAT 46-52-1
 Location: Not Given

Sample Description: Brown soft fibrous with bitumen.

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:	5
Fiberglass:	5	Resilient Material:	
Cellulose:	85	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:

Andrew Pittman

Andrew Pittman

QCAlyst:

S. Arkhipov

Svetlana Arkhipov

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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: 3108
 Client Sample ID: BAT 46-56-1
 Location: Not Given

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

All percentages given below are visually estimated by volume

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

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

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	98

COMMENTS: Paint included as binder.

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Microanalyst: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: BAT 46-57-1 AES Lab ID: 3109
 Location: Not Given

Sample Description: Gray hard compact silty to 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:	20
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	79

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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: BAT 46-58-1 AES Lab ID: 3110
 Location: Not Given

Sample Description: Black semi-hard bitumenous with fibers and aggregates.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:		Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	5
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:		Aluminum:	
Mineral Wool:		Bitumen:	90
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	
Animal Hair:		Binders:	4
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:

Andrew Pittman

Andrew Pittman

QCAlyst:

S. Arkhipov

Svetlana Arkhipov

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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: BAT 46-59-1 AES Lab ID: 3111
 Location: Not Given

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

All percentages given below are visually estimated by volume

ASBESTOS FIBERS		NON-FIBROUS MATERIALS	
Chrysotile:	<1	Vermiculite:	
Amosite:		Biotite:	
Crocidolite:		Mica:	
Anthophyllite:		Perlite:	
Tremolite:		Aggregates:	
Actinolite:		Styrofoam:	
NON-ASBESTOS FIBERS		OTHERS	
Synthetics:	45	Aluminum:	
Mineral Wool:		Bitumen:	50
Fiberglass:	<1	Resilient Material:	
Cellulose:	2	Glue:	
Animal Hair:		Binders:	3
Antigorite:			

COMMENTS: Layer #2 contains 3 % chrysotile. 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: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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BULK SAMPLE ANALYSIS

Client Name: B A T Associates, Inc.
 Project Name: Charleston Naval Shipyard
 Client Sample ID: BAT 46-63-1
 Location: Not Given
 Project Number: 971001
 AES Lab ID: 3112

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

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:	20
Animal Hair:	
Antigorite:	

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

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

COMMENTS: Layer #2 contains 3 % chrysotile. 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: *Andrew Pittman*

Andrew Pittman

QCAlyst: *S. Arkhipov*

Svetlana Arkhipov

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AES Job Number: B203
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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:	3113
Client Sample ID:	BAT 46-62-1		
Location:	Not Given		

Sample Description: Black semi-hard bitumenous to fibrous.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	5
Amosite:	
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:	
Bitumen:	90
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:

Andrew Pittman

Andrew Pittman

QCAnalyst:

S. Arkhipov

Svetlana Arkhipov

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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: 3114
 Client Sample ID: BAT 46-6-1
 Location: Not Given

Sample Description: Tan semi-hard partly granular to 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:	50
Styrofoam:	

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

OTHERS	
Aluminum:	
Bitumen:	
Resilient Material:	
Glue:	
Binders:	49

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:

Andrew Pittman

Andrew Pittman

QCAlyst:

S. Arkhipov

Svetlana Arkhipov

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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: 3115
 Client Sample ID: BAT 46-3-1
 Location: Not Given

Sample Description: Brown semi-hard resilient 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:		Aluminum:	
Mineral Wool:		Bitumen:	
Fiberglass:		Resilient Material:	
Cellulose:	1	Glue:	
Animal Hair:		Binders:	99
Antigorite:			

COMMENTS:

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Microanalyst: *Andrew Pittman*
 Andrew Pittman

QCAlyst: *S. Arkhipov*
 Svetlana Arkhipov

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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: 3116
 Client Sample ID: BAT 46-70-1
 Location: Not Given

Sample Description: Black semi-hard bitumenous to fibrous.

All percentages given below are visually estimated by volume

ASBESTOS FIBERS	
Chrysotile:	5
Amosite:	
Crocidolite:	
Anthophyllite:	
Tremolite:	
Actinolite:	

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

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

OTHERS	
Aluminum:	
Bitumen:	90
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:

Andrew Pittman

Andrew Pittman

QCAAnalyst:

S. Arkhipov

Svetlana Arkhipov

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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

203

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.	BAT46-9-1	16.	BAT46-56-1
2.	BAT46-12-1	17.	BAT46-57-1
3.	BAT46-15-1	18.	BAT46-58-1
4.	BAT46-16-1	19.	BAT46-59-1
5.	BAT46-22-1	20.	BAT46-63-1
6.	BAT46-23-1	21.	BAT46-62-1
7.	BAT46-25-1	22.	BAT46-6-1
8.	BAT46-26-1	23.	BAT46-3-1
9.	BAT46-27-1	24.	46-70-1
10.	BAT46-28-1	25.	46-70-2
11.	BAT46-29-1	26.	46-70-3
12.	BAT46-30-1	27.	
13.	BAT46-50-1	28.	
14.	BAT46-39-1	29.	
15.	BAT46-52-1	30.	
SPECIAL INSTRUCTIONS: Analyze to Positive			
Relinquished by: Joshua Bell		Received by: [Signature]	
Date: 12/29/99	Time: 1342	Date: 1-31-00	Time: 11/2 [Signature]

1/31/00

**ENVIRONMENTAL
MANAGEMENT
INC**

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

Page 1 of 2

PLM ANALYSIS ASBESTOS SUMMARY *

CLIENT NAME: **BAT ASSOCIATES**
PROJECT NAME: **CHARLESTON NSY / 971001-13.03**

PROJECT NO: **00003.000.000**
LAB JOB NO: **B0017**

DATE RCVD: **1/31/00**

SAMPLE LAB ID	SAMPLE FIELD ID	LAYER NUMBER	APPEARANCE	LOCATION / DESCRIPTION	% ASBESTOS (COMMENTS)
1 996	BAT46-3-1QC		BROWN SEMI-HARD RESILIENT		-
2 997	BAT46-9-1QC		GRAY HARD CEMENTITIOUS TO GRANULAR		-
3 998	BAT46-12-1QC		YELLOW SOFT FIBROUS WITH ALUMINUM FOIL AND PAPER		-
4 999	BAT46-15-1QC		WHITE POWDERY TO SILTY WITH FIBERS		-
5 1000-1	BAT46-16-1QC	1 (of 2)	WHITE HARD SILTY WITH YELLOW GLUE		-
6 1000-2	BAT46-16-1QC	2 (of 2)	BLACK MASTIC WITH FIBERS		3%CHR
7 1001	BAT46-22-1QC		WHITE SOFT RESILIENT WITH ALUMINUM FOIL, CANVAS, AND PAPER		-
8 1002	BAT46-23-1QC		GRAY SOFT GUMMY		-
9 1003	BAT46-25-1QC	1+2 (of 2)	1. WHITE HARD SILTY WITH PAINT; 2. GRAY HARD CEMENTITIOUS TO GRANULAR		-
10 1004	BAT46-26-1QC	1+2 (of 2)	1. WHITE HARD SILTY WITH PAINT; 2. GRAY HARD CEMENTITIOUS TO GRANULAR		-
11 1005	BAT46-27-1QC		WHITE HARD SILTY WITH PAINT		-
12 1006	BAT46-28-1QC		WHITE HARD SILTY WITH GLUE		-
13 1007	BAT46-29-1QC		WHITE VERY HARD SILTY		-
14 1008	BAT46-30-1QC		GRAY VERY HARD CEMENTITIOUS TO GRANULAR WITH BLACK MASTIC		-
15 1009	BAT46-39-1QC		GRAY SOFT RESILIENT		-
16 1010	BAT46-50-1QC		GREEN HARD RESILIENT WITH GLUE		(SAMPLE ID # "BAT-50-1QC" LISTED ON COC)

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

QC

.- = NO ASBESTOS DETECTED

02/14/00 MON 11:58 FAX 770 908 7200

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**ENVIRONMENTAL
MANAGEMENT
INC**

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

Page 2 of 2

PLM ANALYSIS ASBESTOS SUMMARY *

CLIENT NAME: **BAT ASSOCIATES**
PROJECT NAME: **CHARLESTON NSY / 971001-13.03**

PROJECT NO: 00003.000.000
LAB JOB NO: B0017
DATE RCVD: 1/31/00

SAMPLE LAB ID	SAMPLE FIELD ID	LAYER NUMBER	APPEARANCE	LOCATION / DESCRIPTION	% ASBESTOS (COMMENTS)
17 1011	BAT46-52-1QC		BROWN SOFT COMPACT FIBROUS WITH BLACK MASTIC AND CANVAS		-
18 1012	BAT46-56-1QC		WHITE VERY HARD SILTY WITH PAINT		-
19 1013	BAT46-57-1QC	1+2 (of 2)	1. WHITE HARD SILTY WITH PAINT; 2. GRAY HARD CEMENTITIOUS TO GRANULAR		-
20 1014	BAT46-58-1QC		BLACK HARD BITUMINOUS		-
21 1015	BAT46-62-1QC		BLACK SEMI-HARD BITUMINOUS WITH FIBERS, CANVAS, AND SILVER PAINT		-
22 1016	BAT46-63-1QC		BLACK SEMI-HARD BITUMINOUS TO FIBROUS		-

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

QC

*- = NO ASBESTOS DETECTED

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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. BAT 43-3-1QC	16. BAT46-52-1QC		
2. BAT46-9-1QC	17. BAT46-56-1QC		
3. BAT46-12-1QC	18. BAT46-57-1QC		
4. BAT46-15-1QC	19. BAT46-58-1QC		
5. BAT46-16-1QC	20. BAT46-62-1QC		
6. BAT46-22-1QC	21. BAT46-63-1QC		
7. BAT46-23-1QC	22. BAT6		
8. BAT46-25-1QC	23.		
9. BAT46-26-1QC	24.		
10. BAT46-27-1QC	25.		
11. BAT46-28-1QC	26.		
12. BAT46-29-1QC	27.		
13. BAT46-30-1QC	28.		
14. BAT46-39-1QC	29.		
15. BAT-50-1QC	30.		
SPECIAL INSTRUCTIONS:			
Relinquished by: <i>Foshie Bell</i>		Received by: <i>Orli Williams</i>	
Date: 12/29/99	Time: 1330	Date:	Time:

1/31/00

[Signature]
 1/31/00 13:30