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PROJECT SURVEILLANCE SERVICES AND AIR MONITORING DURING REMOVAL OF ASBESTOS-CONTAINING MATERIAL QUARTER NH-16 CNC CHARLESTON SC
10/1/2000
BAT ASSOCIATES, INC.

Project Surveillance Services and Air Monitoring During Removal of Asbestos-Containing Material at the North Charleston Naval Base: Quarter NH-61 North Charleston, South Carolina

Contract Number. N62467-96-R-~~0098~~ 0498

Prepared for:

Department of the Navy
Southern Division
NAVFACENGCOM
2155 Eagle Drive
North Charleston, South Carolina 29411

DO-0015

Prepared by:

BAT Associates, Inc.
5151 Brook Hollow Parkway, Suite 250
Norcross, Georgia 300071
Contact Person: Mr. Douglas J. Milton, CIH
770/242-3908

October 2000

BAT
BAT Associates, Inc.
Environmental, Health & Safety Services

5151 Brook Hollow Parkway, Suite 250
Norcross, GA 30071
(770) 242-3908 • FAX (770) 242-3912
e-mail: batassoc@mindspring.com

October 30, 2000

Department of the Navy
Southern Division
NAVFACENGCOM
2155 Eagle Drive
North Charleston, South Carolina 29411

Attention: Mr. Archie Browder

References:

Contract Number: N62467-96-R-0098

Subject.:

Closure Report for Project Surveillance and Air Monitoring
North Charleston Naval Base: Quarter NH-61
North Charleston, South Carolina

Dear Mr. Browder:

BAT Associates, Inc. (BAT) has completed project surveillance and air monitoring activities for the above referenced project. Results of the project indicated that the project site is ready for re-occupancy. A copy of the closure report accompanies this cover letter. Within the report is detailed information concerning project-related activities from start to finish.

Thank you, for the opportunity to work with you on this project. Should you have any questions, please feel free to contact us.

Sincerely,
BAT Associates, Inc.

Dee Parker
Project Industrial Hygenist

Douglas J. Milton, CIH
Director of Health and Safety

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EXECUTIVE SUMMARY

BAT Associates, Inc. (BAT) was retained by the Department of the Navy Southern Division NAVFACENGCOM (SouthDiv.) to perform project surveillance and air monitoring services before, during, and after the removal of asbestos-containing materials (ACM) at the North Charleston Naval Base. Project activities were centered around Quarter NH-61 (hereinafter referred to as the Project Site). Work scheduled at the Project Site included the crawl space 1st floor rooms (125, entrance of 132 and 137), and 2nd floor rooms(223, 224, 225 and 226).

Cape Environmental Management Inc. (Abatement Contractor) was retained by SouthDiv to perform the asbestos removal, disposal, and clean up at the Project Site. Ms. Dee Parker, Project Industrial Hygienist, performed on-site project surveillance and air monitoring for BAT and the Navy. The Contractor was represented by Mr. Mayro Hidalgo, Project Supervisor.

The following paragraphs summarize the information in the report.

1. Project activities began on October 11, 2000 and were completed on October 19, 2000. The scope of work for abatement included the removal of asbestos contaminated soil from the crawl space area and asbestos-containing floor tile and mastic inside building on first and second floors of the Project Site.

2. BAT performed on-site fiber counting using Phase Contrast Microscopy (PCM). All air sample collection and fiber counting were executed in accordance to the National Institute of Occupational Safety and Health (NIOSH) 7400 Method.

   Ninety-seven (97) air samples were collected during the course of the project. Air samples included background samples, work area samples (inside the work containment), critical area samples (outside the work area samples), and final clearance air samples (Refer to Appendix A).

   BAT collected seven final clearance air samples (including field blanks) and evaluated the air samples using PCM. All final clearance air samples indicated airborne fiber concentrations of less than 0.010 fibers per cubic centimeter of air (<0.010 f/cc). All work areas successfully met "release criteria", which included a final visual inspection and final clearance air testing, and all are ready for re-occupation.

1.0 PURPOSE

The purpose for the asbestos abatement activities was to: 1) remove and properly dispose of previously identified friable and non-friable ACM in the crawl space area and inside the building on the first and second floor work areas, and 2) properly clean the work area prior to an anticipated property transfer. SouthDiv initiated an asbestos remediation program to accomplish the aforementioned goals.

1.1 BACKGROUND INFORMATION

A previously performed asbestos survey of the Project Site identified: 1) asbestos-containing contaminated soil inside the crawl space area; 2) asbestos-containing floor covering inside rooms 137, 224 and 226; and 3) asbestos-containing mastic inside rooms 125, 132, 223 and 225. (Refer to Appendix B: Photographic Documentation Photos 1-8)

1.2 SEQUENCE OF WORK

The sections 1.2.1 through 1.2.6 describe the activities executed by the Abatement Contractor during the asbestos abatement and BAT's project surveillance activities. Section 2.0 describes activities performed by BAT while conducting air-monitoring tasks.

1.2.1 Work Area Isolation

The Abatement Contractor performed the following actions to ensure isolation of the work area in accordance with regulatory requirements. Proper warning signs were posted at the entrance of the regulated areas (work areas) to prevent entry by unauthorized persons (Photo 9).

A personal decontamination facility (PDF) was constructed and used by the Abatement Contractor's workers and other work area visitors to dispose of used coveralls and rinse themselves of any dust or debris prior to leaving the clean side of the PDF. The PDF was located at the entrance to the work area and consisted of three primary chambers: 1) dirty room, 2) decontamination shower, and 3) clean room. Each chamber of the PDF was segmented via overlapping curtains constructed of 6-mil polyethylene sheeting. (Photos 10 -12).

1.2.2 Asbestos Removal Procedures

The Abatement Contractor used wet removal methods as the primary engineering control during the removal, disposal, and cleaning process of the asbestos-containing and asbestos-contaminated materials. The Abatement Contractor wetted the materials with an amended water solution before initiating removal and continued wetting the materials throughout the removal process. Other engineering controls used to supplement the wet removal methods included the use of negative pressure differential machines. Negative pressure differential machines extracted potentially contaminated air from the work area, filtered the air using High Efficiency Particulate Absolute (HEPA) filters, and exhausted the filtered air to the outside environment. These machines were located throughout the work areas. (Photos 13-14)

During the removal activities, BAT systematically monitored the filtered exhaust from the negative pressure differential machines for asbestos fiber concentrations. BAT collected air samples representative of the filtered exhaust and evaluated samples via fiber counting (see Section 2.0). All samples indicated that the filtered exhaust were lower than the airborne fiber concentration required to meet release criteria (0.010 f/cc)

Removal of Asbestos-Contaminated Soil

The Contractor's workers donned full-face powered air purifying respirators (P.A.P.R) during the gross removal of asbestos contaminated soil. Other personal protective equipment (PPE) included hooded disposable coveralls with booties, protective footwear, and gloves.

The Contractor used a trailer-mounted vacuum equipped with a HEPA filter to vacuum out approximately 1 inch to 4 inches soil from within the crawl space. The soil was containerized in a three chambered non-permeable bladder bag which was lined inside a transport dumpster. The Vac truck was operated by Mr. Larry Hopkins, of Cross Construction Corp.

Removal of Asbestos-Containing Floor Covering

Prior to removal of floor tile, the Contractor wetted the material using an airless sprayer. The Contractor then removed the floor covering using hand held scrappers keeping the area wet at all times. The Contractor's workers immediately bagged the materials as they went along leaving no debris pile up inside work area.

Removal of Asbestos-Containing Associated Mastic

After the removal of floor tile, the Abatement Contractor employed chemical removal methods to abate the floor mastic associated with the floor tile. Chem-Safe/100, a citrus-based mastic remover, was the preferred chemical. During the removal process, the Abatement Contractor's workers employed organic filters, approved by NIOSH and the Mine Safety Association (MSA), to protect themselves from any potentially dangerous fumes.

After applying the chemical mastic remover, the Abatement Contractor waited the product manufacturer's recommended time to allow the chemical to react with the matrix of the associated mastic. Soon after, the Abatement Contractor's workers used push brooms, brushes and scrappers to manually assist in the removal of the associated mastic. Puddles, resulting from the mastic/chemical mixture, were polled and later absorbed with a sorbant product. After, a push broom and shovel was used to gather the mastic/chemical/sorbant unification. The resulting debris was promptly containerized and double sealed in 6-mil properly labeled asbestos disposal bags.

1.2.3 Disposal of Contaminated Liquid

Asbestos-contaminated shower water, resulting from personnel and equipment decontamination was handled in accordance with regulatory requirements. The Contractor collected all water used throughout the decontamination process in the showers of the PDF. Water was filtered through the Contractor's 3-filter shower filtration unit. The effluent was passed through a 10-micron, 5-micron and 3-micron filtering system. After filtration, the water was discharged into the public sewage system as filtered effluent.

1.2.4 Site Visitation

During the removal and clean-up activities, no site visitation from SouthDiv Representatives or any regulatory agencies were observed.

1.2.5 Pre-Abatement and Final Visual Inspection

BAT performed pre-abatement visual inspections of each work area prior to the start of asbestos removal activities. Final visual inspections were performed by the BAT specialist upon completion of asbestos removal and detailed cleaning.

The pre-abatement visual inspections were performed by Ms. Parker and Mr. Hidalgo (Abatement Contractor's Project Supervisor) upon completion of work area preparations.

During the visual evaluations, the negative pressure differential machines, PDF showers were functioning properly. No breaches in the critical barriers were observed.

BAT performed a final visual inspection at the completion of the asbestos removal and work area clean up. Ms. Parker performed the final visual inspection of all work areas in conformance with practices and procedures consistent with the American Society for Testing and Materials (ASTM), the Navy's Scope-of-Work, and Third Party Monitoring specification. Visual inspections included, but were not limited to, visual reviews of horizontal and vertical surfaces for visible accumulation of asbestos dust and/or asbestos-contaminated debris and signs of associated mastic along floor joints and walls bases. The Abatement Contractor promptly cleaned areas where residual dust and/or debris were identified by the BAT specialist.

Results of the final visual inspections did not identify visible accumulations of asbestos-containing or contaminated dust, debris and/or associated mastic. In preparation for final clearance air testing, the Abatement Contractor encapsulated abated surfaces within the work areas with a penetrating encapsulant to lock-down unseen fibers.

1.2.6 Post-Abatement Inspection

BAT performed post-abatement visual inspections with the Abatement Contractor in the work areas. Locations identified to contain residual ACM after the removal of critical barriers (normally behind duct tape) were HEPA vacuumed and wet wiped until visually clean. . .

2.0 AIR SAMPLE COLLECTION

BAT collected daily air samples from outside the work area, inside the work area, and at the exhaust points of negative pressure differential machines. Air samples were collected on 25 millimeter, 0.8 micron pore size mixed cellulose ester filter cassettes with 50 millimeter, non-conductive cowls. Air samples were collected at an approximate flow rate of 0.5 liters per minute (LPM) to 16.0 LPM, as per NIOSH 7400 Method. The sampling pumps were calibrated before and after each sampling period using a high volume Rotometer calibrated using a primary calibration standard.

Air samples were fiber counted using Phase Contrast Microscopy (PCM) by Ms. Parker. Ms. Parker has successfully completed the National Institute for Occupational Safety and Health (NIOSH) 582 course, *Sampling and Evaluating Airborne Asbestos Dust*, and has successfully participated in the Proficiency Analytical Testing (PAT) program.

2.1 Daily Air Samples

Airborne fiber concentrations at critical barriers and at negative pressure differential exhaust points did not exceed 0.010 f/cc of air during the removal or cleaning process. Although there are no Federal or state regulations governing the concentration of airborne fibers inside work areas, it is noteworthy that during removal activities airborne fiber concentrations, on average, were maintained at or below final clearance thresholds. An airborne fiber concentration of 0.010 f/cc (by PCM) is the EPA-recommended re-occupancy concentration following an asbestos response action. The Occupational Safety and Health Administration (OSHA) instructs that a concentration of 0.100 f/cc is a permissible exposure to airborne asbestos for an 8-hour time weighted average.

Photocopies of the Fiber Counting reports are included in Appendix A: *PCM- Fiber Counting Results.*

2.2 Final Clearance Air Testing

After the abatement work was completed and prior to collecting final clearance air samples, five surface soil samples were collected and sent to an accredited laboratory for analysis while the negative air pressure differential machines, equipped with HEPA filters, were used to evacuate any residual airborne fibers, and to reduce the moisture in the work area.

An "aggressive" final clearance air testing protocol was used inside the building where asbestos-containing flooring and associated mastic removal was performed. Aggressive sampling consisted of agitating the air in each work area with an electrically operated, one-horse power leaf blower. Aggressive air sample collection techniques create a worst-case scenario from which clearance samples may be collected.

A "non-aggressive" clearance air testing protocol was used inside the crawl space area to avoid filter overload with dirt and dust debris on cassettes.

BAT collected five final clearance air samples at the Project Site, inside each contained work area (5) using high volume pumps and PCM air filter cassettes. Filters were fiber counted via PCM. All samples indicated airborne fiber concentrations less than 0.010 f/cc.

3.0 FINAL CLEARANCE SOIL SAMPLE COLLECTION

Prior to collecting final clearance air samples, BAT collected five surface soil samples at the Project Site inside the crawl space area using a rigid containers. Each container was uniquely labeled and recorded on a chain-of-custody form prior to submission for analysis.

The soil samples were forwarded to an independent laboratory, Analytical Environmental Services, (AES), for analysis using Polarized Light Microscopy (PLM). AES, located in

Atlanta, Georgia, is an accredited laboratory registered with the American Industrial Hygiene Association. AES is a successful participant of the National Institute of Standards and Technology (NIST)/AIHA sponsored National Voluntary Laboratory Accreditation Program (NVLAP #1020820)

All soil samples were analyzed for the presence and estimated quantity of asbestos. Analysis was conducted using PLM and dispesion staining techniques. Samples were analyzed in accordance with the EPA "Method for the Detection of Asbestos in Bulk Building Materials", EPA/600/R-93/116, July 1993. All samples were identified to contain <10% asbestos as per the National Emission Standards for Hazardous Air Pollutants (NESHAP). One of the nine soil samples as identified to contain 3% asbestos. EPA defines an asbestos material as any material containing greater the 1%.

BAT required the Abatement Contractor to remove soil in a 12-inch radius around the area that the 3% asbestos-contaminated soil was collected. A visual re-inspection identified no suspect ACM.

4.0 DATA EVALUATION

All critical barriers, work areas, and negative pressure differential exhaust point air sample fiber concentrations were <0.010 f/cc of air. An airborne fiber concentration of 0.010 f/cc, is the EPA recommended airborne fiber concentration level for re-occupancy. No residual dust, debris or mastic was noted upon completion of the final visual inspections. Final clearance air samples indicated airborne fiber concentrations of less than the EPA re-occupancy standard of 0.010 f/cc.

5.0 CONCLUSION

Based on BAT's field observations, visual inspection, and fiber counting results, the asbestos abatement activities were performed in conformance to the project work plan and applicable Federal and state regulations. With the conclusion of removal and cleaning activities, BAT informed SouthDiv of the successful final clearance air results and announced the availability to re-occupy the 1st and 2nd floors of the Project Site.

6.0 RECOMMENDATIONS

Based on BAT's field observations, the following recommendations should be considered

1) Write an ACM operations and maintenance plan (O&M) including the soil located in the crawl space. The O&M Plan should be maintained until the soil is:
    a) Enclosed with a permanent non-permeable barrier (i.e. concrete) or
    b) Removed down to a non-permeable foundation

2) Included the crawl space in the facility's non-permit confined space entry Program. Within the program and specific to this site, a "buddy system" should be required.

7.0 LIMITATIONS

The conclusions presented in this report are based on: 1) visual observations performed during and after asbestos removal and final cleaning; 2) the results of fiber counting the collected air samples; and 3) the results of final clearance air samples evaluated via PCM. Airborne fiber concentrations will vary between sample locations. BAT's assessment of the Abatement Contractor's work performance is a professional opinion, arrived at through the methods and procedures accepted by the industry. No warranty is expressed or implied.

This report has been prepared on behalf of the Southern Division of the Navy and their authorized affiliates. Should any other person, partnership, or corporation desire to rely upon this report, it will be necessary for BAT Associates, Inc., to update it for the new user.

APPENDIX A

PCM – Fiber Counting Results

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 03 OCT 00 QUARTER: NH-61 2 OF 3 TYPE: Backgrouds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-141	BG. ROOM 125 / 1ST FLOOR	3008	0.000	0.001	0.010	<0.010
971001-15-142	BG · ROOM 131 / 1ST FLOOR	3008	0.000	0.001	0.010	<0.010
971001-15-143	BG · ROOM 224/2ND FLOOR	3008	0.000	0.001	0.010	<0.010
971001-15-144	BG · ROOM 228/2ND FLOOR	3008	0.001	0.001	0.010	0.001
971001-15-145	BG. HALLWAY / 1ST FLOOR	3024	0.001	0.001	0.010	<0.010
971001-15-146	BG. CRAWL SPACE	3040	0.000	0.001	0.010	<0.010
971001-15-147	BG. CRAWL SPACE	2960.5	0.000	0.000	0.010	<0.010
971001-15-148	BG · CRAWL SPACE	3040	0.000	0.001	0.010	<0.010
971001-15-149	BG · CRAWL SPACE	3056	0.000	0.001	0.010	<0.010
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background **IWA – Inside Work Area** **OWA – Outside Work Area** **FC – Final Clearance** **MFC – Measured Fiber Concentration** **LOD – Limit of Detection**

LOQ – Limit of Quantification **RFC – Reported Fiber Concentration**

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10.11.00 QUARTER: NH.61 (2of3) TYPE: Backgrounds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-193	IWA. CRAWL SPACE	3072	0.000	0.000	0.010	<0.010
971001-15-194	IWA. CRAWL SPACE	3072	0.000	0.000	0.010	<0.010
971001-15-195	IWA. CRAWL SPACE	2976	0.000	0.000	0.010	<0.010
971001-15-196	OWA. ENTRANCE TO CRAWL SPACE	3072	0.000	0.000	0.010	<0.010
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·12·00 QUARTER: NH 61 (1of3) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-197	LAB BLANK	—	—	—	—	Ø f/mm²
971001-15-198	FIELD BLANK	—	—	—	—	Ø f/mm²
971001-15-199	OWA · CLEAN ROOM · DECON	699	0.003	0.003	0.044	<0.044
971001-15-200	OWA · DIRTY ROOM · DECON	711	0.005	0.003	0.043	0.005
971001-15-201	IWA · CRAWL SPACE	343.5	0.031	0.006	0.090	0.031
971001-15-202	OWA · BASEMENT	711	0.003	0.003	0.044	0.005
971001-15-203	OWA · N.A.M. EXHAUST	681	0.000	0.003	0.045	<0.045
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

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LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·13·00 QUARTER: NH·61 (1of2) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-212	LAB BLANK	—	—	—	—	∅ f/mm²
971001-15-213	FIELD BLANK	—	—	—	—	∅ f/mm²
971001-15-214	OWA· CLEAN ROOM · DECON AM	753	0.001	0.002	0.041	<0.041
971001-15-215	OWA· DIRTY ROOM · DECON	753	0.002	0.002	0.041	<0.041
971001-15-216	IWA· CRAWL SPACE	378	0.011	0.005	0.082	0.011
971001-15-217	OWA· BASEMENT	753	0.001	0.002	0.041	<0.041
971001-15-218	OWA· N.A.M. EXHAUST	765	0.000	0.002	0.040	<0.040
971001-15-219	OWA· CLEAN ROOM · DECON PM	918	0.002	0.002	0.033	<0.033
971001-15-220	OWA· DIRTY ROOM · DECON	924	0.003	0.002	0.033	0.003
971001-15-221	IWA· CRAWL SPACE	447	0.007	0.004	0.069	0.007

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

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LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·13·00 QUARTER: NH·61 (2 of 2) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-222	OWA·BASEMENT	924	0.000	0.002	0.033	<0.033
971001-15-223	OWA·NAM. EXHAUST	945	0.001	0.002	0.032	<0.032
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

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LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·16·00 QUARTER: NH·61 (1of3) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-224	LAB BLANK	—	—	—	—	∅ f/mm²
971001-15-225	FIELD BLANK	—	—	—	—	∅ f/mm²
971001-15-226	OWA· CLEAN ROOM·DECON AM	798	0.000	0.002	0.038	<0.038
971001-15-227	OWA· DIRTY ROOM·DECON	792	0.001	0.002	0.039	<0.039
971001-15-228	IWA· CRAWL SPACE	399	0.006	0.005	0.077	<0.077
971001-15-229	OWA· BASEMENT	528	0.001	0.004	0.058	<0.058
971001-15-230	OWA· N.A.M. EXHAUST	520	0.000	0.004	0.059	<0.059
971001-15-231	OWA·CLEAN ROOM·DECON PM	735	0.000	0.002	0.042	<0.042
971001-15-232	OWA·DIRTY ROOM·DECON	617.5	0.001	0.003	0.050	<0.050
971001-15-233	IWA· CRAWL SPACE	220	0.008	0.009	0.140	<0.140

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

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LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·16·00 QUARTER: NH·61 (2of3) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-234	OWA · BASEMENT	494	0.002	0.004	0.062	<0.062
971001-15-235	OWA · N.A.M. EXHAUST					POWER FAILURE
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

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LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·16·00 QUARTER: NH·61 (3of3) TYPE: Backgrounds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-236	IWA. RM.125 / 1ST FLOOR	3120	0.000	0.000	0.009	<0.009
971001-15-237	IWA. RM.137 / 1ST FLOOR	3088	0.000	0.000	0.010	<0.010
971001-15-238	OWA. HALLWAY / 1ST FLOOR	3056	0.000	0.000	0.010	<0.010
971001-15-239	IWA. RM.224 / 2ND FLOOR	3040	0.000	0.000	0.010	<0.010
971001-15-240	IWA. RM.225 / 2ND FLOOR	3088	0.000	0.000	0.010	<0.010
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

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BG – Background **IWA – Inside Work Area** **OWA – Outside Work Area** **FC – Final Clearance** **MFC – Measured Fiber Concentration** **LOD – Limit of Detection**

LOQ – Limit of Quantification **RFC – Reported Fiber Concentration**

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10.17.00 QUARTER: NH·61 (1of1) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-241	LAB BLANK	—	—	—	—	Ø f/mm²
971001-15-242	FIELD BLANK	—	—	—	—	Ø f/mm²
971001-15-243	OWA. CLEAN ROOM·DECON AM	1225	0.001	0.001	0.025	<0.025
971001-15-244	OWA. DIRTY ROOM·DECON	1205	0.001	0.001	0.025	<0.025
971001-15-245	IWA. 2ND FLOOR CONTAINMENT	388.5	0.006	0.005	0.079	<0.079
971001-15-246	OWA. HALLWAY AT STAIRS	1225	0.001	0.001	0.025	<0.025
971001-15-247	OWA. CLEAN ROOM·DECON PM	1190	0.001	0.001	0.026	<0.026
971001-15-248	OWA. DIRTY ROOM·DECON	1205	0.001	0.001	0.025	<0.025
971001-15-249	IWA. 2ND FLOOR CONTAINMENT	340.5	0.002	0.006	0.091	<0.091
971001-15-250	OWA. HALLWAY AT STAIRS	1180	0.000	0.001	0.026	<0.026

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background **IWA – Inside Work Area** **OWA – Outside Work Area** **FC – Final Clearance** **MFC – Measured Fiber Concentration** **LOD – Limit of Detection**

LOQ – Limit of Quantification **RFC – Reported Fiber Concentration**

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·18·00 QUARTER: NH·61 (1of5) TYPE: Backgrounds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-251	LAB BLANK	—	—	—	—	∅ f/mm²
971001-15-252	FIELD BLANK	—	—	—	—	∅ f/mm²
971001-15-253	FC.. CRAWL SPACE	3056	0.000	0.000	0.010	<0.010
971001-15-254	FC· CRAWL SPACE	3040	0.000	0.000	0.010	<0.010
971001-15-255	FC· CRAWL SPACE	3056	0.000	0.000	0.010	<0.010
971001-15-256	FC· CRAWL SPACE	3072	0.000	0.000	0.010	<0.010
971001-15-257	FC· CRAWL SPACE	3088	0.000	0.000	0.010	<0.010
971001-15-						
971001-15-						
971001-15-						

D. Parker
Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background **IWA – Inside Work Area** **OWA – Outside Work Area** **FC – Final Clearance** **MFC – Measured Fiber Concentration** **LOD – Limit of Detection**

LOQ – Limit of Quantification **RFC – Reported Fiber Concentration**

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·18·00 QUARTER: NH·61 (2 of 5) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-258	IWA · ROOM 137	720	0.004	0.003	0.043	0.004
971001-15-259	OWA · NORTH END OF HALLWAY	954	0.001	0.002	0.032	<0.032
971001-15-260	OWA · BACK ENTRANCE TO CAFE.	956	0.000	0.002	0.032	<0.032
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10.18.00 QUARTER: NH.61 (3of5) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-261	IWA. ROOM 125	328.5	0.008	0.006	0.094	<0.094
971001-15-262	OWA. S/WEST HALLWAY	438	0.003	0.004	0.070	<0.070
971001-15-263	OWA. STAIRWELL AREA	430	0.001	0.005	0.072	<0.072
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10.18.00 QUARTER: NH.61 (4 of 5) TYPE: Backgrounds (Daily) Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-264	IWA · ROOM 132	139.5	0.015	0.015	0.222	<0.222
971001-15-265	OWA · FOYER	184	0.004	0.011	0.168	<0.168
971001-15-266	OWA · FRONT ENTRANCE TO CAFETERIA	184	0.001	0.011	0.168	<0.168
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background **IWA – Inside Work Area** **OWA – Outside Work Area** **FC – Final Clearance** **MFC – Measured Fiber Concentration** **LOD – Limit of Detection**

LOQ – Limit of Quantification **RFC – Reported Fiber Concentration**

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·18·00 QUARTER: NH·61 (5 of 5) TYPE: Backgrounds Daily (Clearance)

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-267	FC· ROOM 223	3072	0.000	0.000	0.010	<0.010
971001-15-268	FC· ROOM 224	3072	0.000	0.000	0.010	<0.010
971001-15-269	FC· ROOM 225	3104	0.000	0.000	0.009	<0.009
971001-15-270	FC·ROOM 226	3104	0.000	0.000	0.009	<0.009
971001-15-271	FC· HALLWAY	3008	0.000	0.000	0.010	<0.010
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

D Baker
Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10.19.00 QUARTER: NH.61 (1of3) TYPE: Backgrounds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-272	LAB BLANK	—	—	—	—	Ø f/mm²
971001-15-273	FIELD BLANK	—	—	—	—	Ø f/mm²
971001-15-274	FC · ROOM 125	3040	0.000	0.000	0.010	<0.010
971001-15-275	FC · ROOM 125	3040	0.000	0.000	0.010	<0.010
971001-15-276	FC · ROOM 125	3040	0.000	0.000	0.010	<0.010
971001-15-277	FC · ROOM 125	3024	0.000	0.000	0.010	0.001
971001-15-278	FC · ROOM 125	3024	0.000	0.000	0.010	<0.010
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·19·00 QUARTER: NH·61 (2 of 3) TYPE: Backgrounds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-279	FC. Room 132	3024	0.000	0.000	0.010	<0.010
971001-15-280	FC. Room 132	3024	0.000	0.000	0.010	<0.010
971001-15-281	FC. Room 132	3024	0.000	0.000	0.010	<0.010
971001-15-282	FC. Room 132	3024	0.001	0.000	0.010	0.001
971001-15-283	FC. Room 132	3024	0.000	0.000	0.010	<0.010
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

BAT Associates, Inc. Field Sample Data Form
Fiber Counting Using Phase Contrast Microscopy

DATE: 10·19·00 QUARTER: NH·61 (3of3) TYPE: Backgrounds Daily Clearance

Sample ID	Sample Location	Volume (L)	MFC (f/cc)	LOD (f/cc)	LOQ (f/cc)	RFC (f/cc)
971001-15-284	FC · Room 137	3024	0.000	0.000	0.010	< 0.010
971001-15-285	FC · Room 137	3024	0.000	0.000	0.010	< 0.010
971001-15-286	FC · Room 137	3024	0.000	0.000	0.010	< 0.010
971001-15-287	FC · Room 137	3024	0.000	0.000	0.010	< 0.010
971001-15-288	FC · Room 137	3024	0.000	0.000	0.010	< 0.010
971001-15-						
971001-15-						
971001-15-						
971001-15-						
971001-15-						

Analyst's Signature

Douglas J. Milton, CIH
Laboratory Manager

Legend:

BG – Background IWA – Inside Work Area OWA – Outside Work Area FC – Final Clearance MFC – Measured Fiber Concentration LOD – Limit of Detection

LOQ – Limit of Quantification RFC – Reported Fiber Concentration

APPENDIX B

PLM – Soil Sample Results

BAT ASSOCIATES, INC.
Chain-of-Custody

№ 006

Project #	Project Name/Location
971001 15.01	CNS / NH-61

Samplers: (signature)

Station #	Date	Time	Comp	Grab	Station Location	No. of Containers	Parameters						REMARKS
NH-61-01	10-16	1515		/		1 of 5							PLM ANALYSIS - SAME DAY
NH-61-02	10-16	1516		/		2 of 5							
NH-61-03	10-16	1518		/		3 of 5							
NH-61-04	10-16	1519		/		4 of 5							
NH-61-05	10-16	1521		/		5 of 5							

Relinquished by: (signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	10-16-00	1845					
Relinquished by: (signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)

Relinquished by: (signature)	Date	Time	Received for laboratory by: (Signature)	Date	Time	Remarks:

Distribution: Original Accompanies Shipment. Copy returned with Report.

See back for locations

Form #93-09

JULY 1993

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
Bulk Sample Summary Report

AES

NVLAP

Client Name: B A T Associates, Inc.
Project Name: CNS/NH-61
Project Number: 971001 15.01

AES Job Number: B3478
Tuesday, October 17, 2000

Client ID	AES ID	Location	Asbestos Mineral Percentage						Comments
			CH	AM	CR	AN	TR	AC	
NH.61-01	32151		<1						Iron oxide included as binder.
NH.61-02	32152		<1						Iron oxide included as binder.
NH.61-03	32153		<1						Iron oxide included as binder.
NH.61-04	32154		<1						Iron oxide included as binder.
NH.61-05	32155		<1						Iron oxide included as binder.

Note: CH=chrysotile, AM=amosite, CR=crocidolite, AC=actinolite, TR=tremolite, AN=anthophyllite.
For comments on the samples, see the individual analysis sheets.

PLM is not consistently reliable in detecting small concentrations of asbestos in floor tiles and similar nonfriable materials. Quantitative TEM is currently the only method that can be used to determine the conclusive asbestos content.

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. All percentages given are by visually estimated volume. 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.

Microanalyst: Arkadiy Gundilin

QC Analyst: Svetlana Arkhipov

APPENDIX C

Photographic Documentation

PHOTO 1: View of the Pre-existing site conditions inside the crawl space area prior to removal activities.

PHOTO 2: View of pre-existing conditions in room 137.

PHOTO 3: View of pre-existing conditions in room 224.

Photo 4: View of pre-existing conditions in room 226

PHOTO 5: View of pre-existing conditions in room 125, bathroom area.

PHOTO 6: View of the pre-existing conditions in room 132 (entrance to bathroom only)

PHOTO 7: View of the pre-existing conditions in room 223.

:**PHOTO 8:** View of the pre-existing conditions in room 225.

PHOTO 9: View of the Project Site. Note the barrier tape encompassing the work site and the warning signs taped to the barrier tape. The 2 windows on the left show where the Negative Air Machines are exhausting out of the building.

PHOTO 10: View of the personal decontamination facility (PDF).

PHOTO 11: View of the front side of the PDF leading into the crawl space area. Note the Danger signs are posted in both English and Spanish.

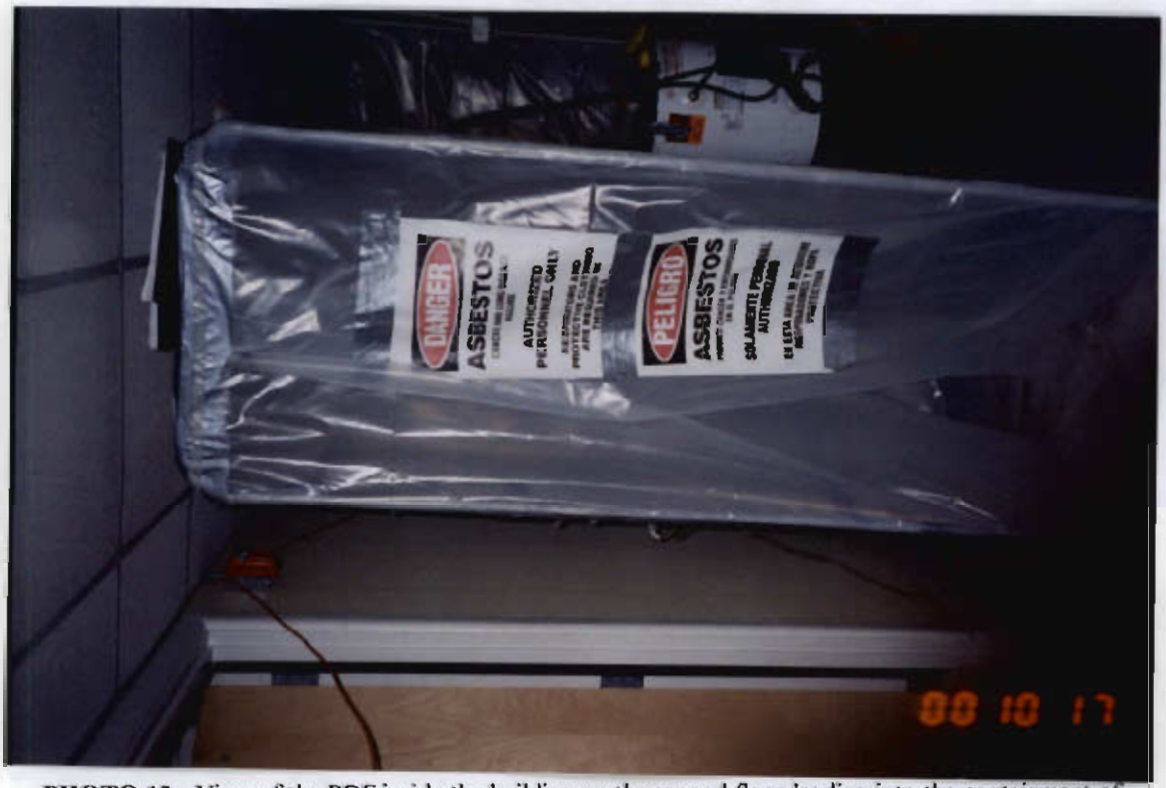

PHOTO 12: View of the PDF inside the building on the second floor leading into the containment of rooms 223, 224, 225 and 226

PHOTO 13: View of the Negative Air Machines, barrier tape demarcating the work area and the generator used for electricity to work areas.

PHOTO 14: View from the front of the building shows extensions cords running into upstairs work area. Note the two windows over the entrance way is where the two Negative Air Machines are exhausting outside of building.

APPENDIX C

Professional Certification

APPENDIX D

Professional Certification

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

ASBESTOS ABATEMENT LICENSE

No. 23145

This certifies that

De Arna P. Parker

249-AP-8980

doing business as B A T Associates, Inc.

has satisfactorily completed the training required by South Carolina Regulation No. 61-86.1 for the category of

Air Sampler

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 06/14/00.

09/12/00

Richard D. Sharpe

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

09/12/00 11:21

Bureau of Air Quality

ORIGINAL

CR-001126

Medical University of South Carolina

College of Health Professions

Program in Environmental Health Sciences

19 Hagood Avenue, Charleston, South Carolina 29425 (843) 792-5315

Certifies that

DEARNA P. PARKER

Attended and Satisfactorily Completed

Supervision of Asbestos Abatement Refresher

conducted June 14, 2000 through June 14, 2000

and passed an exam on June 14, 2000.

SR27120-02983	8	249-33-8980	T.A. Rowland, III
Certificate Number	Contact Hours	ID Number	Program Director
June 14, 2000	June 13, 2001		T. A. Rowland III
Exam Date	Certificate Expires		Instructor

AUGET LARGIENDO
UNIV. MED. CAR. AUS. 1824

This certifies that the above recipient has completed the requisite training for Asbestos Accrediation under TSCA Title II.

Medical University of South Carolina
College of Health Professions
Program in Environmental Health Sciences

19 Hagood Avenue, Charleston, South Carolina 29425 (843) 792-5315

Certifies that

DEARNA P. PARKER

Attended and Satisfactorily Completed

Inspecting for Asbestos in Buildings Refresher

conducted August 10, 2000 through August 10, 2000

and passed an exam on August 10, 2000.

IR27120-02526	4	249-33-8980	T.A. Rowland, III
Certificate Number	Contact Hours	ID Number	Program Director
August 10, 2000	August 9, 2001		T. A. Rowland III
Exam Date	Certificate Expires		Instructor

This certifies that the above recipient has completed the requisite training for Asbestos Accrediation under TSCA Title II.

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation

DEPARTMENT OF COMMERCE ★ UNITED STATES OF AMERICA ★

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:

AIRBORNE ASBESTOS FIBER ANALYSIS

September 30, 2001
Effective through

David F. Alderman
For the National Institute of Standards and Technology

NVLAP Lab Code: 102082-0

NVLAP-01C (11-95)