FINAL DOCUMENTATION

FOR

WTC UNOCCUPIED BUILDING MONITORING PROGRAM
125 CEDAR STREET
NEW YORK, NEW YORK 10006
BLOCK 52, LOT 21

PREPARED FOR
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL COMPLIANCE
59-17 JUNCTION BOULEVARD
FLUSHING, NEW YORK 11373

PREPARED BY
ATC ASSOCIATES INC.
104 EAST 25TH STREET, 10TH FLOOR
NEW YORK, NEW YORK 10010

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ATC ASSOCIATES INC.

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Client:	New York City Department of Environmental Protection Bureau of Environmental Compliance 59-17 Junction Boulevard Flushing, New York 11373
Client Representative:	Mr. R. Radhakrishnan Director Asbestos Control Program
Abatement Contractor:	Action Environmental Remediation, Inc
Project Location:	125 Cedar Street New York, New York
Services Performed by ATC Associates Inc.:	Project management, air monitoring, wipe sampling, clearance sampling and analytical services as per the monitoring contractor specifications prepared by the USEPA and NYCDEP.

EXECUTIVE SUMMARY

ATC Associates Inc. (ATC) provided project monitoring, air sampling and management services for the interior dust clean-up activities for the unoccupied building located at 125 Cedar Street, New York, New York. Actual field operations were held from September 12, 2002, with the collection of background wipe samples through November 1, 2002 with the completion of post testing. Background wipe samples for settled dust were analyzed in accordance with the project specifications and the individual analytes were as follows: Lead, Mercury, Poly Aromatic Hydrocarbons, and Dioxin. Clean-up activities within the unoccupied building was conducted in accordance with generally accepted industry practices, as well as the Project specification issued by the New York City Department of Environmental Protection

Action Environmental Remediation, Inc., a New York State Department of Labor (NYSDOL) licensed asbestos abatement contractor, performed the cleaning services. ATC performed project monitoring, air sampling and management services for the interior dust clean-up activities including; review of contractor worker certification, Contractor oversight, daily collection and analysis of ambient and clearance air sampling.

Prior to the start of cleaning activities, ATC inspected that each area was under negative air flow to ensure compliance with the project Scope of Work Procedures. Negative air flow entailed the installation of negative air units within the apartments commercial spaces and basement. As the clean-up project progressed, ATC continuously monitored the Contractor's work practices, generated daily site logs, and collected ambient air samples in areas surrounding the abatement work areas. All ambient air samples collected during this project were less than 70 structures per cubic centimeter as specified, well below acceptable levels established by federal regulations (AHERA).

Once the Contractor completed cleaning activities from within all areas, in accordance with project Scope of Work Procedures, ATC, NYCDEP and USEPA visually inspected each work area to ensure the areas were decontaminated to a level of no visible debris. Following successful final visual inspection, ATC performed final air and wipe clearance sampling in accordance with project Scope of Work Procedures. Air clearance sampling entailed collection of fiberglass air samples, analyzed via NIOSH method 7400 "B" counting rules, crystalline silica, analyzed via NIOSH 7500, as well as an EPA modified Transmission Electron Microscopy (TEM) AHERA standard referred to as PCMe. All TEM air samples were analyzed by ATC's New York City laboratory, with all sample results satisfying the USEPA final air clearance criteria for this project of less than or equal to 0.0009 f/cc PCMe.

Clearance wipe sampling was performed consistent with generally accepted industrial hygiene practices. The acceptable results of the sampling represent conditions found on the dates the samples were collected. Individual analytes specified earlier were again analyzed in accordance with the project specifications utilizing the following analytical procedures:

- Lead, EPA Method SW-846-6010B
- PAHs, ASTM-6661-01, EPA Method SW-846-8270C
- Dioxin, ASTM-6661-01, EPA Method SW-846-8290
- Mercury, EPA Method SW-846-7471A

SCOPE OF WORK

All work performed was conducted in compliance with general industry practices, applicable relevant and appropriate regulations, including, but not limited to the USEPA, USDOL, NYSDOL, NYSDEC, NYCDEP, NYCDOS, and NYCDOH. The scope of work entailed a thorough cleaning of all surfaces within each apartment unit, except as noted within the Project specifications. Cleaning entailed the use of water to mist material prior to cleaning without generating water accumulations. All waste was subsequently double bagged and appropriately labeled prior to disposal. On occasion, equipment that proved to be difficult to clean via wet wiping techniques (i.e.: electrical equipment, fin tube radiators, appliances, etc.) was cleaned by using low pressure compressed air to dislodge settled dust prior to cleaning.

PROJECT DESCRIPTION

Work Sequence

The following lists the sequence of cleaning of surfaces:

- Mobilized equipment and personnel to job site (ATC and Action).
- Collected and analyzed background wipe samples (ATC).
- Posted warning signs to establish regulated work areas (Action).
- Constructed engineering controls per Contract Documents and current regulations (Action).
- Performed pre-abatement inspection of Contractor engineering controls (ATC).
- Collected ambient air samples to monitor airborne asbestos fiber levels (ATC).
- Performed required clean-up of surfaces (Action).
- Performed oversight of Contractor work practices (ATC)
- Performed proper removal and disposal of generated waste from the work areas (Action).
- Performed visual inspections to ensure no visible debris remaining in work areas (ATC).
- Collected and analyzed final air clearance samples (ATC).
- Collected and analyzed final wipe clearance samples (ATC).
- Disassembled and cleaned work area (Action).

Engineering Controls

Action employed the following engineering controls during the removal of all ACM from the work areas:

- Isolated each work area per Contract Documents, and to the satisfaction of the on-site Project Monitor.
- Constructed a three-stage decontamination unit with shower.
- Installed HEPA-filtered negative pressure exhaust fans.
- Engineering controls were inspected by ATC for compliance with all applicable local, state, and federal rules and regulations.

Work Procedures

Measures to minimize the release of fibers during cleaning included:

- Wetting of settled dust with water prior to disturbing.
- Promptly placing removed settled dust in plastic bags for proper disposal.
- Wet wiping and HEPA vacuuming all surfaces.

Worker Protection

Workers who entered the work area during cleaning activities wore disposable protective clothing (Tyvek suits) and proper respiratory protection including ½ face, air purifying respirators with High Efficient Particulate Air (HEPA) filters.

Decontamination

Workers performed proper decontamination upon exiting each work area by:

- Removing and disposing of protective clothing.
- Removing and Rinsing respirator.
- Showering.
- Donning street clothing.

Disposal

Action placed asbestos-containing waste material in doubled and labeled impermeable plastic bags and transported them to enclosed roll-off containers lined with polyethylene sheeting for pickup and disposal.

AIR MONITORING

Sample Collection

Asbestos and Fibrous Glass

ATC collected asbestos and fibrous glass samples of air on 25 millimeter, mixed-cellulose ester filter membranes (0.45 & 0.8 micron pores respectively) contained in manufacturer pre-assembled, three-piece cassettes with electrically conductive, extended cowls. Pump flow rates were determined (both at the start and at the end of the sampling period and periodically by a representative of the NYCDEP) with a secondary standard (rotameter) that is calibrated quarterly against a primary standard (Gilian Instrument Corporation primary flow calibrator "Gilibrator"). Fibers from ambient air were collected with the filter cassette open-faced and positioned between three to five feet above the floor.

Silica

In order to collect the desired Silica air samples for analysis, ATC performed the following tasks for air collection. A desired filter and support pad was placed into a three-piece cassette and inserted into the cyclone, which pressed firmly into the center ring of the cassette.

ATC calibrated the pump with the cyclone-cassette assembly in-line using a primary standard calibrator. The pumps, complete with cyclone-cassette assembly, were set in the breathing zone. The pump remained in their set positions for the entire sampling period. At the end of the sampling period, the cyclone/cassette assembly was removed from the holder. The cyclone was then removed from the cassette and transported to the lab for analysis.

Air Sample Analysis

Fibrous Glass

PCM fibrous glass clearance samples were analyzed by ATC's New York City laboratory utilizing the PCM method of analysis. The microscope used for sample analysis was equipped with a phase contrast condenser. Sizing and fiber counts were performed at 400X magnification. Samples were analyzed by the National Institute of Occupation Safety and Health (NIOSH) Method 7400 using method "B" counting rules. Method "B" rules counts only the ends of fibers that have a length-to-width ratio greater than five-to-one. All air sample results are reported in fibers per cubic centimeter of air (f/cc).

Asbestos
Asbestos clearance air samples were analyzed via Transmission Electron Microscopy (TEM) utilizing the USEPA's PCMe method of structure counting. PCMe

TEM ambient air samples were analyzed by ATC's New York City laboratory under strict AHERA protocol. TEM with Energy Dispersive X-ray analysis (EDX) involves subjecting the prepared filter media to a stream of electrons. The returning diffraction pattern is a signature for the elemental composition of the material. This allows for precise asbestos quantification.

Silica
A suspension of the sample particulate in tetrahydrofuran (THF) is created by dissolving the sample filter in THF and then sonicating. The sample particulate is then deposited onto a silver membrane filter and analyzed by X-ray diffraction giving a series of diffraction peaks (lines) occurring at different angles relative to the sample and X-ray source. These specific peaks are indicative of elemental silica and can be quantified.

Quality Assurance

Analysis was performed by personnel who have completed the NIOSH 582 Sampling and Evaluating Airborne Asbestos Dust course or an equivalent course.

Personnel also participate in the NIOSH/AIHA (American Industrial Hygiene Association) Proficiency Analytical Testing (PAT) Program to ensure consistency in methodology. All laboratory technicians involved in air sample analysis have received applicable EPA training.

Air Sample Results

Final air clearance samples reported concentrations of airborne fibers less than the concentrations required by the USEPA for this project.

The clearance air sampling criteria for each of the following analytes were achieved in accordance with project specifications.

- Asbestos in air, 0.0009 f/cc PCMe
- Fibrous glass in air, <0.01 f/cc
- Crystalline silica in air, 0.5 $\mu g/m^3$
- Mercury, between 1 and 2 mg/m^2

The attached appendices contain all laboratory analysis information.

WIPE SAMPLING

Background and clearance wipe sampling was performed consistent with generally accepted industrial hygiene practices. All acceptable results of the sampling represent conditions found on the dates the samples were collected. Individual analytes specified herein were analyzed in accordance with the project specifications utilizing the following analytical procedures:

- Lead, EPA Method SW-846-6010B
- PAHs, ASTM-6661-01, EPA Method SW-846-8270C
- Dioxin, ASTM-6661-01, EPA Method SW-846-8290
- Mercury, EPA Method SW-846-7471A

WIPE SAMPLE ANALYSIS

Lead
ATC's New York City laboratory performed atomic absorption spectroscopy (AAS) to determine the presence of lead in clearance wipe samples.

In elemental form, lead will absorb ultraviolet light at a specific wavelength when excited by heat. ATC's AAS instrument looks for the presence of lead by focusing a beam of uv light at a specific wavelength through a flame and into a detector. The wipe sample is aspirated into the flame. If that metal is present in the sample, it will absorb some of the light, thus reducing its intensity. The instrument measures the change in intensity. A computer data system converts the change in intensity into an absorbance.

As concentration goes up, absorbance goes up. The analyst can then construct a calibration curve by running standards of various concentrations on the AAS and observing the absorbance.

PAH
Method 8270 was used to quantitate polyaromatic hydrocarbon compounds that are soluble in methylene chloride and capable of being eluted, without derivatization, as sharp peaks from a gas chromatographic fused-silica capillary column coated with slightly polar silicone.

Dioxin
The analytical method calls for the use of high-resolution gas chromatography and high-resolution mass spectrometry (HRGC/HRMS) on purified sample extracts. Samples containing concentrations of specific congeneric analytes (PCDDs and PCDFs) considered within the scope of this method that are greater than ten times the upper MCLs must be analyzed by a protocol designed for such concentration levels, e.g., Method 8280. An optional method for reporting the analytical results using a 2,3,7,8-TCDD toxicity equivalency factor (TEF) was also conducted. However, in accordance with a request made by the USEPA, all

non-detect congeners were reported at 50% of the analytical sensitivity, thereby yielding a more conservative recalculated TEF.

Mercury
This analytical method is a cold-vapor atomic absorption method and is based on the absorption of radiation at the 253.7-nm wavelength by mercury vapor. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic absorption spectrophotometer. Absorbance (peak height) is measured as a function of mercury concentration.

WIPE SAMPLING RESULTS

The clearance wipe criteria for each of the following analytes were achieved in accordance with project specifications.

- Lead in settled dust, <25µg/ft^2
- PAHs in settled dust, <0.3 mg/m^2
- Dioxin in settled dust, <4ng/m^2
- Mercury, between 1 and 2 mg/m^2

The attached appendices contain all laboratory analysis information.

CONCLUSIONS

Based on project oversight, including results of air sampling and wipe sampling data collected, it is the professional opinion of ATC that all cleaning at 125 Cedar Street, New York, New York was conducted in accordance with the project manual as well as all applicable federal, state and local asbestos regulations. All ambient and final air clearance and wipe sample results were found to have a concentration satisfactory to achieve the acceptable criteria established by the NYCDEP and USEPA standards for re-occupancy following cleaning activities. Cleaning of the areas was deemed acceptable upon achieving NYCDEP and USEPA defined primary clearance levels. The primary clearance levels for this project were defined as:

- Dioxin in settled dust, <4ng/m^2
- Lead in settled dust, <25µg/ft^2
- Asbestos in air, 0.0009 f/cc PCMe

In addition to the primary clearance levels, secondary clearance levels were utilized to determine the need of additional cleaning. However, secondary clearance level analytical results did not warrant such additional cleaning.

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the field of environmental science and engineering in this region. This statement is in lieu of other statements either expressed or implied. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations, is at risk of said user.

ATC ASSOCIATES INC.

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