

Gilsenan, Michael

From: Theodorellys, Penny
Sent: Thursday, February 06, 2003 2:45 PM
To: Radhakrishnan, Krish
Cc: Gilsenan, Michael; Smyth, Virginia
Subject: 114 Liberty Street Scopes of Work



114 Liberty Scope
Clean-up.doc...



114 Liberty St
Monitoring 2 6 ...

Attached please find the revised scopes of works.
These are the current drafts.

DRAFT 2/6/03**Asbestos Contractor – Cleaning Procedures****New York City Department of Environmental Protection
Bureau of Environmental Compliance****Background**

A site visit at 114 Liberty Street revealed minor amounts of dust accumulation present on horizontal surfaces throughout the interior of the building. The building is currently unoccupied. The interior cleaning is to be accomplished by a licensed asbestos abatement contractor.

Purpose

A New York State Department of Labor (NYSDOL) licensed asbestos contractor with NYCDEP and NYSDOL certified workers shall perform the clean-up of building interiors (12 stories –5,000 to 6,000 square feet per floor). Each apartment occupies an entire floor with the exception of the top floor that is a duplex and the apartment on the third floor that shares the floor with two commercial spaces. The entire interior of the building (residential, commercial, retail spaces, common spaces, etc.) is included in this work. The building has central HVAC systems on each floor.

Scope of Work

- (1) All work performed shall be in compliance with all applicable, relevant, and appropriate regulations, including but not limited to those of the United States Environmental Protection Agency (USEPA), the United States Department of Labor, the New York State Department of Labor (NYSDOL), the New York State Department of Environmental Conservation, the New York City Department of Sanitation, the New York City Department of Health (NYCDOH), and the New York City Department of Environmental Protection. (NYCDEP).
- (2) An ACP-7 form, asbestos project notification form shall be submitted as required by Title 15, Chapter 1 of the Rules of the City of New York (RCNY), directly to the NYC DEP Asbestos Control Program prior to the start of work. USEPA and NYSDOL notification shall be submitted.
- (3) A third party air monitoring firm shall perform air sampling and provide project oversight.
- (4) The asbestos contractor shall provide sufficient equipment and experienced personnel to complete work area preparation and cleaning activities of the building interiors within three (3) weeks. Water/electrical supply shall be provided by residents/owner. At least one asbestos supervisor shall be present per work area during the duration of the clean-up activities. Work shall be performed 24 hours per day, seven (7) days per week.
- (5) Personal protective equipment including disposable clothing, gloves, and respirators shall be worn during this clean-up activity.
- (6) Warning signs shall be posted at the approach to each work area.
- (7) A separate worker and waste decontamination enclosure system in compliance with Title 15, Chapter 1 of the RCNY shall be installed at the entrance to each work area. More than one work

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area may be established. Work shall proceed from the 12th floor down to the first floor. The use of a remote decontamination enclosure system is acceptable. Prior approval must be received from the NYCDEP for decontamination enclosure system placement and phasing of clean-up activities, if required.

- (8) An entry/exit log in compliance with the requirements set forth in Title 15, Chapter 1 of the RCNY shall be maintained in the clean room. The site supervisor shall maintain an activity log.
- (9) Initially, the interior of the elevator shaft, including the top of the elevator car and the elevator pit, shall be HEPA vacuumed and wet wiped to allow for the use of the elevator during the clean up. Once the clean up throughout the building is complete, the elevator shaft, including the top of the elevator car and the elevator pit, shall be re-cleaned prior to clearance air monitoring.
- (10) Isolation barrier locations (i.e.: wall or ceiling penetrations, windows, vents, doors, etc.) shall be HEPA vacuumed and wet wiped prior to installing two-layers of 6-mil polyethylene sheeting and sealed with tape. Window wells, ledges, guards, etc., that are accessible from the interior shall be cleaned.
- (11) Negative pressure ventilation equipment (air filtration devices –AFDs) shall be installed and operated continuously 24 hours per day during all clean-up activities. Equipment shall run continuously until clearance air monitoring. A minimum of one air change every 15 minutes shall be provided. When ducting to the outside is not possible, a second negative air unit compatible with the primary unit may be connected in series.
- (12) Dropped ceilings at functional air plenums shall be removed. Interior and perimeter walls shall be removed to access the interstitial spaces for cleaning. Only one side of each wall shall be removed to access the space. The back of walls scheduled to remain (i.e. tiled bathroom walls) shall be wet wiped and HEPA-vacuumed. For specific information regarding the location of walls to be removed, please refer to the plans.
- (13) The HVAC Systems and associated ductwork shall be removed and disposed in accordance with applicable rules and regulations.
- (14) All debris and/or dust shall be misted and double bagged. Accumulation of water is prohibited. Water misting shall be sufficient to wet the material without water accumulations. Caution shall be taken to avoid wetting items that may be damaged by wet methods. An encapsulating agent shall not be applied.
- (15) All surfaces shall be wet wiped and HEPA vacuumed. Once the initial cleaning is performed, and all surfaces are dry, a second cleaning shall be performed. Surfaces include but are not limited to walls, floors, ceilings, ledges, windowsills, trims, appliances, equipment, personal items, and furnishings. Fireproofing and insulation shall be HEPA-vacuumed only. Care shall be taken to minimize the disturbance of the fireproofing and insulation. The fireproofing is not ACM according to the information provided to the DEP.
- (16) Surfaces that may not be wet wiped shall be HEPA vacuumed three times or disposed as ACM waste. Disposal of material may not occur without prior authorization by the building owner and/or resident, as applicable. Items identified by residents for cleaning that cannot be cleaned shall be

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immediately brought to the attention of DEP. DEP will provide a determination. Any agreement to dispose the item(s) must be received in writing from the owner and/or resident as applicable.

- (17) Resident and/or owner, as applicable, must identify items to be cleaned or disposed. Tags shall be placed on items to be disposed. The contractor shall dispose tagged items unless otherwise indicated in this scope of work. Special conditions or handling instructions may also be specified within units. These include items/locations not to be incorporated in this scope of work. Residents shall provide written notice of special instructions and items not to be handled with their authorizations.
- a) Residents and/or owner shall identify items for disposal with clearly legible tags. Residents and/or owner, as applicable, shall make the final decision on cleaning or disposal of items. Items shall be cleaned by wet wiping and/or HEPA-vacuuming procedures, as appropriate. Compressed dry air (low pressure) may be used to blow debris/dust from openings/crevices in the items. HEPA vacuuming must be preformed in conjunction with this procedure. Care must be taken not to damage the items. Residents shall provide a written listing of items to be disposed prior to the mandatory pre-bid walk through..
 - b) Items identified for disposal (tagged) shall be double-wrapped in 6-mil polyethylene sheeting and labeled as ACM waste or bagged in labeled ACM waste bags. The cleaning of items to be disposed is not required. In lieu of disposal as ACM waste, larger items may be cleaned and disposed as non-regulated waste with prior approval by the Department.
 - c) Built-in items shall be disassembled, removed, and stored in a central location prior to the initiation of this contract by the resident/owner. The components of the built-in cabinets shall be wet wiped, HEPA vacuumed, and stored within each unit in a designated staging area for these items. The contractor shall not be responsible for removing or disassembling other built-in items that may be present. Built-in items shall be cleaned in place using wet wiping and HEPA vacuuming techniques.
 - d) Kitchen stoves shall be wet wiped and HEPA vacuumed, and shall remain in the units. All other appliances shall be removed and disposed. The surfaces beneath the appliances shall be cleaned in accordance with procedures specified in this scope of work whenever possible, without causing damage to cabinets or appliances.
- (18) All equipment used for cleaning activities shall be vacuumed and/or wet wiped prior to removal from the work area.
- (19) The project monitor shall perform a thorough visual inspection to verify the absence of visual dust accumulations. Additional clean-up procedures shall be performed where visible dust is observed.
- (20) Upon successful visual inspection, the work area shall be isolated from the remainder of the work site pending clearance monitoring. Clearance monitoring shall be performed after completion of all clean up activities at the work site.
- (21) The Technician(s) shall perform clearance sampling after the area is free of dust accumulations as determined by the Project Monitor. The apartment will be re-cleaned and retested if the clearance criteria are not achieved. The Contractor is responsible for the costs of re-cleaning associated with

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*Cleaning Procedures
For
114 Liberty Street*

failure to meet the clearance criteria. The clearance air monitoring criteria have been established by the USEPA for this clean up activity (WTC Vicinity). The clearance criteria are as follows:

Parameter	Clearance Level	Note
Asbestos in air	0.0009 f/cc PCMe	Primary clearance level
Lead in settled dust	<25 µg/ft ²	Primary clearance level
Dioxin in settled dust	<4 ng/m ²	Primary clearance level
Fibrous glass in air	<0.01 f/cc	Secondary clearance level
Crystalline silica in air	1 µg/m ³	Secondary clearance level
PAHs in settled dust	<0.3 mg/m ²	Primary clearance level

- (22) After successful clearance monitoring, isolation barriers shall be removed in accordance with the applicable requirements of Title 15, Chapter 1 of the RCNY.
- (23) The cleaning contractor is not responsible for damage or loss caused by the acts of parties not involved with the cleanup. Resident shall be responsible for the removal of any valuables. If such removal is not feasible, the resident shall notify the Project Monitor in writing (including original receipt, formal appraisal, or estimated value) as to the location, description and value of said item.
- (24) Disposal of all wastes generated during the cleaning shall be the responsibility of the contractor. All waste generated shall be treated as asbestos-containing material (ACM) with the exception of items that can be cleaned prior to disposal. As specified above, large items may be cleaned and disposed as non-regulated waste with prior authorization by the Department. Transportation and disposal of generated waste shall be in compliance with all applicable rules and regulations.
- (25) All work shall be in compliance with all other applicable requirements of Title 15, Chapter 1 of the RCNY.
- (26) The following table contains special conditions and handling instructions for items in specific units. Items not specifically referenced in this table shall be handled in accordance with the procedures specified in this scope of work and in written documentation provided by residents via DEP.

Floor No.	Action Item / Notables
5 th	A partition/ barrier shall be installed at the damaged north wall.
4 th	A partition/ barrier shall be installed at the damaged north wall and ceiling.
3 rd	Commercial space: The HVAC system, associated ductwork and suspended ceiling shall be removed and discarded.
1 st	The HVAC system and associated ductwork, and stove exhaust ducts shall be removed and discarded.

- (27) Time sheets shall be submitted to DEP on a weekly basis.
- (28) At the completion of work a final report shall be submitted to DEP. The final report shall include copies of the daily logs (activities and entry/exit logs), waste manifests, etc.

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**New York City Department of Environmental Protection
Bureau of Environmental Compliance**

**Monitoring Contractor
Scope of Work for 114 Liberty Street, Manhattan**

Background

A follow-up visit to 114 Liberty Street revealed minor dust accumulations present on surfaces within the interior of the building. The interior cleaning is to be accomplished by a licensed asbestos abatement contractor and monitored by a Monitoring Contractor.

Purpose

The Monitoring Contractor shall provide personnel experienced, trained, and certified in environmental sampling and asbestos air monitoring to be on-site, full-time, during work area preparation and cleaning phases of building interiors (12 stories –5,000 to 6,000 square feet per floor). Each apartment occupies an entire floor with the exception of the top floor that is a duplex and the apartment on the third floor that shares the floor with two commercial spaces. The entire interior of the building (residential, commercial, retail spaces, common spaces, etc.) is included in this work. Each floor has central HVAC systems.

The Monitoring Contractor shall provide qualified staff to observe the work, conduct air monitoring and sampling, and monitor the cleanup of the building interiors to ensure compliance with the project specifications and appropriate regulatory requirements. The Monitoring Contractor shall provide clearance sampling and analyses.

The Monitoring Contractor shall provide qualified staff to collect samples for asbestos, lead, polyaromatic hydrocarbons (PAHs), dioxin, fibrous glass, and crystalline silica.

An accredited laboratory shall perform all sample analyses.

The Work shall be performed 24 hours per day, seven (7) days per week. Pre-clean up sampling must begin within 24 hours of receipt of the *Commence Work* letter. All pre-clean up samples must be completed and submitted to the laboratory for analysis within 48 hours.

Air Monitoring/Construction Inspection Services

Air monitoring by a Monitoring Contractor shall be conducted during all cleanup activities. The Monitoring Contractor shall provide individuals certified as project monitors and air sampling technicians to perform daily air sampling and inspections from the commencement of the project through final clearance sampling. The Monitoring Contractor shall provide sufficient equipment and experienced personnel to monitor work area preparation and cleaning phases of the building interiors.

Qualifications

Project Monitoring

The Project Monitors must possess valid NYS Asbestos Project Monitor certificates. Monitors must have served as a third party project monitor on at least 25 asbestos abatement projects. The Project

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Monitor must have performed final clearance inspections on at least 25 asbestos abatement projects. A single individual with Asbestos Project Monitor and Asbestos Project Sampling Technician certification shall not perform the functions of both Monitor and Technician during this project.

Air Sampling Technicians

Air monitoring technicians must possess valid NYS Asbestos Project Sampling Technician (APST) certificates. Technicians must have performed air sampling for at least 6 months. At a minimum at least 5 Air Sampling Technicians must be assigned to this project. A single individual with Asbestos Project Monitor and Asbestos Project Sampling Technician certification shall not perform the functions of both Monitor and Technician during this project.

Wipe Sampling Technicians

Wipe sampling technicians must have 1-year experience in wipe sampling for a variety of contaminants and have received state certified training in dust sampling. At a minimum at least 2 Wipe Sampling Technicians must be assigned to this project.

Equipment

Sampling equipment must be in sufficient quantity to provide the amount and type of samples required for this project. The following equipment is required: air-sampling pumps with flow rate capacities of 2 to 10 liters per minute, tripods, rotometers, sample cassettes with mixed cellulose ester filters having pore size of 0.8µm, micro vacuum, disposable porous cellulosic towlettes moistened with wetting agent, solvent-wetted sampling agent, and all other equipment required to perform the specified monitoring and sampling.

Analytical Laboratory

The environmental laboratory must be certified by the New York State Department of Health. Certification for all the analytes specified herein must have been maintained for at least six (6) consecutive proficiency testing rounds. The laboratory must possess a gas chromatograph equipped with a capillary column and high-resolution mass spectrometer for analyzing dioxin and inductively coupled plasma for total metals.

Proof of qualifications must be presented to the NYCDEP prior to commencement of work. The NYCDEP reserves the right to disqualify any individual(s) from work on this project for non-compliance with these specifications or the requirements of applicable rules and regulations.

Specifications

It is anticipated that the work will be completed within three (3) weeks. Post clean up sampling shall begin within 4 hours of successful visual inspection and shall be completed within 2 days.

Sampling and Analytical Procedures for Lead, PAHs, Dioxin, Fibrous Glass, and Silica

1. Sampling for lead, PAHs, and dioxin shall be performed by the wipe sampling technician. A completed chain of custody must accompany all samples. A unique sample number shall be assigned to each sample. A complete written description and/or diagram shall clearly identify each sampling location.

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2. Post cleaning air samples for fibrous glass and silica shall be collected concurrently with the asbestos clearance air sampling procedures specified herein. Five samples for fibrous glass and one sample for silica shall be collected in each apartment.

3. Wipe samples shall be collected before and after cleaning for lead, dioxin, and PAHs.

Prior to the cleaning activities, three wipe samples shall be collected for each of these parameters in each apartment. The sampling locations shall be a wall, a bare floor, and a counter or tabletop.

After cleaning activities, three wipe samples shall be collected for each of these parameters in each apartment. The sampling locations shall be a wall, a bare floor, and a counter or tabletop; preferably at the same location as the pre-cleaning samples.

4. The required sampling and analytical procedures are specified in Table 1.
5. The detection limit for PAHs shall be no greater than 1 $\mu\text{g}/\text{m}^2$.
6. Samples containing concentrations of specific congeneric analytes (PCDDs and PCDFs) considered within the scope of the dioxin sampling 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. Analytical results shall be reported using a 2,3,7,8-TCDD toxicity equivalence (TEQ). The TEQs shall be reported four ways. A TEQ which sets non-detects to zero (i.e., TEQ (ND=0)), a TEQ which sets non-detects at 1/2 the detection limit (i.e., TEQ (ND=1/2)), a TEQ Estimated Maximum Potential Concentration with non-detects set to zero (i.e., TEQ EMPC (ND=0)), and a TEQ Estimated Maximum Potential Concentration with non-detects set to 1/2 the detection limit (i.e., TEQ EMPC (ND=1/2)). Please see attachment 2 for the format and data to report for dioxin wipe samples.

Table 1: Sampling and Analytical Methods

Parameter	Description	Sampling Methodology	Analytical Method	Maximum Turnaround Time
Lead	Wipe samples	HUD Appendix 13.1	EPA Method SW-846-6010B	1 day
PAHs	Wipe samples	ASTM D6661-01	ASTM-6661-01 EPA SW-846-8270C	14 days
Dioxin	Wipe samples	ASTM 6661-01	ASTM 6661-01 EPA Method SW-846-8290	14 days
Fibrous Glass	Air samples	NIOSH 7400	NIOSH 7400, Counting Method "B"	3 days
Crystalline Silica	Air samples	NIOSH 7500	NIOSH 7500 (XRD)	14 days
Asbestos	Air samples	Collection using NIOSH 7400	Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CRF Part 763 Final Rule (AHERA) [see Attachment 1] and NIOSH 7400 (PCM)	1 day

DRAFT 2/6/03**Asbestos Air Sample Collection and Analysis**

1. All asbestos air sampling methodologies shall be in accordance with the applicable sections of Title 15, Chapter 1 of the Rules of the City of New York and AHERA. (see reference in Table 1)
2. Asbestos air samples shall be analyzed in accordance with EPA 40 CRF Part 763 Final Rule (AHERA) using a transmission electron microscope (TEM) and reported as shown in Attachment 1. For the TEM analysis, two size fractions should be reported, a fraction that represents fibers >0.5 microns and a fraction that represents fibers >5 microns. The fraction that represents the fibers >5 microns is considered to be the PCM equivalent (i.e., PCMe) that should be compared to the primary clearance value of 0.0009 s/cc. In addition, the asbestos air samples shall be analyzed in accordance with NIOSH 7400 for standard PCM analysis. These results shall be reported on a separate sheet. The detection limit shall be 0.0004 f/cc.
3. A turnaround time of 24 hours is required for all samples.

Asbestos Air Monitoring

1. Five (5) ambient air samples shall be collected outside but in the general vicinity of the work site. Samplers shall be placed in reasonable proximity to the building and away from obstructions, vents, and drafts that may unduly affect airflow.
2. Five (5) air samples shall be collected per day during cleanup activities. The flow rate shall be set at the minimum collection flow rate specified by the manufacturer for the sampling pump. The flow rate shall not exceed 3 liters per minute. A minimum sampling volume of 3600 liters shall be collected.

Samples shall be collected at isolation barriers outside the work area, the clean room of the worker/waste decontamination facility, and outside of the building.

3. Sample collection methodologies shall be in accordance with Title 15, Chapter 1 of the Rules of the City of New York (RCNY) and AHERA regarding documentation and sample locations and the requirements set forth herein regarding the rates of flow, and required volumes to achieve the necessary analytical sensitivity.
4. Sampling equipment shall be placed at representative locations and away from obstruction. Sampling cassette must be placed on a tripod and not taped to existing surfaces. All air sampling equipment shall be pre- and post- calibrated to insure accurate air sampling volumes.
5. The Air Sampling Technician shall perform clearance air sampling after the areas are free of dust accumulations as determined by the Project Monitor. All surfaces must be completely dry prior to the start of sampling. Clearance air sampling shall be performed at each apartment. Five samples shall be collected in each apartment and two samples shall be collected at the first floor lobby. The elevator shaft shall be cleared separately. Clearance air monitoring shall be performed after the

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completion of **all** clean up activities at the work site. Clearance air sampling shall be aggressive and performed in accordance with Title 15, Chapter 1 of the RCNY Section 1-43 (a)-(d).

6. Clearance air samples shall be collected in accordance with the procedures specified in the NIOSH 7400 Method. The flow rate for collection of air samples shall be at least 10 liters per minute and no more than 15 liters per minute. Air sampling cassettes must be monitored to ensure the filters do not develop dark spots that would indicate clogging. The minimum sampling volume is 3600 liters. If clogging develops, the cassette must be changed.
7. All clearance air samples and completed chain of custody forms must be transported to the laboratory immediately after sampling is completed.

Clearance Criteria

1. The following clearance levels have been established by the USEPA for clean up activities resulting from the collapse of the WTC.

Table 2: Clearance Criteria

<i>Parameter</i>	<i>Clearance Level</i>	<i>Note</i>
Asbestos in air	0.0009 f/cc PCMe	Primary clearance level
Lead in settled dust	<25 µg/ft ²	Primary clearance level
Dioxin in settled dust	<4ng/m ²	Primary clearance level
Fibrous glass in air	<0.01 f/cc	Secondary clearance level
Crystalline silica in air	1µg/m ³	Secondary clearance level
PAHs in settled dust	<0.3 mg/m ²	Primary clearance level

Cleaning shall not be considered complete unless the primary clearance levels are achieved (see Table 2). The apartment will be re-cleaned and retested if the primary clearance levels are not achieved. These clearance levels may be re-evaluated and revised if determined necessary based on field conditions and analytical limitations. Secondary clearance levels shall be considered in determining the need for additional cleanup, however failure to meet the secondary clearance levels does not automatically trigger the re-cleaning. In the event re-cleaning is required, re-sampling shall be performed immediately upon completion of the cleaning.

Project Monitoring

1. The project monitor shall provide oversight of clean-up activities to ensure compliance with project specifications, tenants authorizations, and applicable rules and regulations. The project monitor shall be present on site during all cleaning activities. The project monitor shall coordinate all scheduling requirements for timely completion of the work (completion of work area preparation and cleaning activities within three (3) weeks. The project monitor shall maintain the inventory of valuable items in each unit as provided by tenants. A copy of the contractor requirements is attached. For additional and specific tasks, refer to this attachment.
2. The project monitor shall provide daily monitoring of all work activities to insure compliance with the scope-of-work, the applicable rules and regulations, and the contracts. This includes but is not limited to the verification of worker certification status, the use of proper engineering controls and appropriate work practices.

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3. The project monitor shall direct corrective actions when appropriate and shall be responsible to stop work until corrections are made. Findings must be reported immediately to DEP via telephone call. Written notification of observation and corrective actions must be received by the DEP within 48 hours of telephone call.
4. A final report shall be submitted to the DEP within 7 days of project completion. The report shall clearly identify the work performed in each unit and shall include all laboratory reports, chain-of-custody forms, field notes, copies of employee credentials (i.e. certificates), tenant and owner authorizations, etc.

Gilsenan, Michael

From: Theodorellys, Penny
Sent: Thursday, February 06, 2003 2:53 PM
To: maddaloni.mark@epamail.epa.gov; nace.charles@epamail.epa.gov
Cc: Radhakrishnan, Krish; Gilsenan, Michael
Subject: 114 Liberty Street Monitoring Contractor Specifications



114 Liberty St
Monitoring 2 6 ...

Attached please find the revised monitoring specification with your comments included. I am awaiting the attachments referenced in your correspondence and will include your reporting guidelines. We will be moving forward quickly and I would appreciate any other feedback as soon as possible.

Thanks again, the inclusion of the language for the changes was very helpful.

Please confirm receipt and review of this document.

— Penny
(718) 595-3657
fax (718) 595-3744

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**New York City Department of Environmental Protection
Bureau of Environmental Compliance**

**Monitoring Contractor
Scope of Work for 114 Liberty Street, Manhattan**

Background

A follow-up visit to 114 Liberty Street revealed minor dust accumulations present on surfaces within the interior of the building. The interior cleaning is to be accomplished by a licensed asbestos abatement contractor and monitored by a Monitoring Contractor.

Purpose

The Monitoring Contractor shall provide personnel experienced, trained, and certified in environmental sampling and asbestos air monitoring to be on-site, full-time, during work area preparation and cleaning phases of building interiors (12 stories –5,000 to 6,000 square feet per floor). Each apartment occupies an entire floor with the exception of the top floor that is a duplex and the apartment on the third floor that shares the floor with two commercial spaces. The entire interior of the building (residential, commercial, retail spaces, common spaces, etc.) is included in this work. Each floor has central HVAC systems.

The Monitoring Contractor shall provide qualified staff to observe the work, conduct air monitoring and sampling, and monitor the cleanup of the building interiors to ensure compliance with the project specifications and appropriate regulatory requirements. The Monitoring Contractor shall provide clearance sampling and analyses.

The Monitoring Contractor shall provide qualified staff to collect samples for asbestos, lead, polycyclic aromatic hydrocarbons (PAHs), dioxin, fibrous glass, and crystalline silica.

An accredited laboratory shall perform all sample analyses.

The Work shall be performed 24 hours per day, seven (7) days per week. Pre-clean up sampling must begin within 24 hours of receipt of the *Commence Work* letter. All pre-clean up samples must be completed and submitted to the laboratory for analysis within 48 hours.

Air Monitoring/Construction Inspection Services

Air monitoring by a Monitoring Contractor shall be conducted during all cleanup activities. The Monitoring Contractor shall provide individuals certified as project monitors and air sampling technicians to perform daily air sampling and inspections from the commencement of the project through final clearance sampling. The Monitoring Contractor shall provide sufficient equipment and experienced personnel to monitor work area preparation and cleaning phases of the building interiors.

Qualifications

Project Monitoring

The Project Monitors must possess valid NYS Asbestos Project Monitor certificates. Monitors must have served as a third party project monitor on at least 25 asbestos abatement projects. The Project

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Monitor must have performed final clearance inspections on at least 25 asbestos abatement projects. A single individual with Asbestos Project Monitor and Asbestos Project Sampling Technician certification shall not perform the functions of both Monitor and Technician during this project.

Air Sampling Technicians

Air monitoring technicians must possess valid NYS Asbestos Project Sampling Technician (APST) certificates. Technicians must have performed air sampling for at least 6 months. At a minimum at least 5 Air Sampling Technicians must be assigned to this project. A single individual with Asbestos Project Monitor and Asbestos Project Sampling Technician certification shall not perform the functions of both Monitor and Technician during this project.

Wipe Sampling Technicians

Wipe sampling technicians must have 1-year experience in wipe sampling for a variety of contaminants and have received state certified training in dust sampling. At a minimum at least 2 Wipe Sampling Technicians must be assigned to this project.

Equipment

Sampling equipment must be in sufficient quantity to provide the amount and type of samples required for this project. The following equipment is required: air-sampling pumps with flow rate capacities of 2 to 10 liters per minute, tripods, rotometers, sample cassettes with mixed cellulose ester filters having pore size of 0.8µm, micro vacuum, disposable porous cellulosic towellettes moistened with wetting agent, solvent-wetted sampling agent, and all other equipment required to perform the specified monitoring and sampling.

Analytical Laboratory

The environmental laboratory must be certified by the New York State Department of Health. Certification for all the analytes specified herein must have been maintained for at least six (6) consecutive proficiency testing rounds. The laboratory must possess a gas chromatograph equipped with a capillary column and high-resolution mass spectrometer for analyzing dioxin and inductively coupled plasma for total metals.

Proof of qualifications must be presented to the NYCDEP prior to commencement of work. The NYCDEP reserves the right to disqualify any individual(s) from work on this project for non-compliance with these specifications or the requirements of applicable rules and regulations.

Specifications

It is anticipated that the work will be completed within three (3) weeks. Post clean up sampling shall begin within 4 hours of successful visual inspection and shall be completed within 2 days.

Sampling and Analytical Procedures for Lead, PAHs, Dioxin, Fibrous Glass, and Silica

1. Sampling for lead, PAHs, and dioxin shall be performed by the wipe sampling technician. A completed chain of custody must accompany all samples. A unique sample number shall be assigned to each sample. A complete written description and/or diagram shall clearly identify each sampling location.

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2. Post cleaning air samples for fibrous glass and silica shall be collected concurrently with the asbestos clearance air sampling procedures specified herein. Five samples for fibrous glass and one sample for silica shall be collected in each apartment.

3. Wipe samples shall be collected before and after cleaning for lead, dioxin, and PAHs.

Prior to the cleaning activities, three wipe samples shall be collected for each of these parameters in each apartment. The sampling locations shall be a wall, a bare floor, and a counter or tabletop.

After cleaning activities, three wipe samples shall be collected for each of these parameters in each apartment. The sampling locations shall be a wall, a bare floor, and a counter or tabletop; preferably at the same location as the pre-cleaning samples.

4. The required sampling and analytical procedures are specified in Table 1.
5. The detection limit for PAHs shall be no greater than 1 $\mu\text{g}/\text{m}^2$.
6. Samples containing concentrations of specific congeneric analytes (PCDDs and PCDFs) considered within the scope of the dioxin sampling 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. Analytical results shall be reported using a 2,3,7,8-TCDD toxicity equivalence (TEQ). The TEQs shall be reported four ways. A TEQ which sets non-detects to zero (i.e., TEQ (ND=0), a TEQ which sets non-detects at 1/2 the detection limit (i.e., TEQ (ND=1/2), a TEQ Estimated Maximum Potential Concentration with non-detects set to zero (i.e., TEQ EMPC (ND=0), and a TEQ Estimated Maximum Potential Concentration with non-detects set to 1/2 the detection limit (i.e., TEQ EMPC (ND=1/2). Please see attachment 2 for the format and data to report for dioxin wipe samples.

Table 1: Sampling and Analytical Methods

Parameter	Description	Sampling Methodology	Analytical Method	Maximum Turnaround Time
Lead	Wipe samples	HUD Appendix 13.1	EPA Method SW-846-6010B	1 day
PAHs	Wipe samples	ASTM D6661-01	ASTM-6661-01 EPA SW-846-8270C	14 days
Dioxin	Wipe samples	ASTM 6661-01	ASTM 6661-01 EPA Method SW-846-8290	14 days
Fibrous Glass	Air samples	NIOSH 7400	NIOSH 7400, Counting Method "B"	3 days
Crystalline Silica	Air samples	NIOSH 7500	NIOSH 7500 (XRD)	14 days
Asbestos	Air samples	Collection using NIOSH 7400	Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CRF Part 763 Final Rule (AHERA) [see Attachment 1] and NIOSH 7400 (PCM)	1 day

DRAFT 2/6/03**Asbestos Air Sample Collection and Analysis**

1. All asbestos air sampling methodologies shall be in accordance with the applicable sections of Title 15, Chapter 1 of the Rules of the City of New York and AHERA. (see reference in Table 1)
2. Asbestos air samples shall be analyzed in accordance with EPA 40 CRF Part 763 Final Rule (AHERA) using a transmission electron microscope (TEM) and reported as shown in Attachment 1. For the TEM analysis, two size fractions should be reported, a fraction that represents fibers >0.5 microns and a fraction that represents fibers >5 microns. The fraction that represents the fibers >5 microns is considered to be the PCM equivalent (i.e., PCMe) that should be compared to the primary clearance value of 0.0009 s/cc. In addition, the asbestos air samples shall be analyzed in accordance with NIOSH 7400 for standard PCM analysis. These results shall be reported on a separate sheet. The detection limit shall be 0.0004 f/cc.
3. A turnaround time of 24 hours is required for all samples.

Asbestos Air Monitoring

1. Five (5) ambient air samples shall be collected outside but in the general vicinity of the work site. Samplers shall be placed in reasonable proximity to the building and away from obstructions, vents, and drafts that may unduly affect airflow.
2. Five (5) air samples shall be collected per day during cleanup activities. The flow rate shall be set at the minimum collection flow rate specified by the manufacturer for the sampling pump. The flow rate shall not exceed 3 liters per minute. A minimum sampling volume of 3600 liters shall be collected.

Samples shall be collected at isolation barriers outside the work area, the clean room of the worker/waste decontamination facility, and outside of the building.

3. Sample collection methodologies shall be in accordance with Title 15, Chapter 1 of the Rules of the City of New York (RCNY) and AHERA regarding documentation and sample locations and the requirements set forth herein regarding the rates of flow, and required volumes to achieve the necessary analytical sensitivity.
4. Sampling equipment shall be placed at representative locations and away from obstruction. Sampling cassette must be placed on a tripod and not taped to existing surfaces. All air sampling equipment shall be pre- and post- calibrated to insure accurate air sampling volumes.
5. The Air Sampling Technician shall perform clearance air sampling after the areas are free of dust accumulations as determined by the Project Monitor. All surfaces must be completely dry prior to the start of sampling. Clearance air sampling shall be performed at each apartment. Five samples shall be collected in each apartment and two samples shall be collected at the first floor lobby. The elevator shaft shall be cleared separately. Clearance air monitoring shall be performed after the

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completion of all clean up activities at the work site. Clearance air sampling shall be aggressive and performed in accordance with Title 15, Chapter 1 of the RCNY Section 1-43 (a)-(d).

6. Clearance air samples shall be collected in accordance with the procedures specified in the NIOSH 7400 Method. The flow rate for collection of air samples shall be at least 10 liters per minute and no more than 15 liters per minute. Air sampling cassettes must be monitored to ensure the filters do not develop dark spots that would indicate clogging. The minimum sampling volume is 3600 liters. If clogging develops, the cassette must be changed.
7. All clearance air samples and completed chain of custody forms must be transported to the laboratory immediately after sampling is completed.

Clearance Criteria

1. The following clearance levels have been established by the USEPA for clean up activities resulting from the collapse of the WTC.

Table 2: Clearance Criteria

<i>Parameter</i>	<i>Clearance Level</i>	<i>Note</i>
Asbestos in air	0.0009 f/cc PCMe	Primary clearance level
Lead in settled dust	<25 µg/ft ²	Primary clearance level
Dioxin in settled dust	<4ng/m ²	Primary clearance level
Fibrous glass in air	<0.01 f/cc	Secondary clearance level
Crystalline silica in air	1µg/m ³	Secondary clearance level
PAHs in settled dust	<0.3 mg/m ²	Primary clearance level

Cleaning shall not be considered complete unless the primary clearance levels are achieved (see Table 2). The apartment will be re-cleaned and retested if the primary clearance levels are not achieved. These clearance levels may be re-evaluated and revised if determined necessary based on field conditions and analytical limitations. Secondary clearance levels shall be considered in determining the need for additional cleanup, however failure to meet the secondary clearance levels does not automatically trigger the re-cleaning. In the event re-cleaning is required, re-sampling shall be performed immediately upon completion of the cleaning.

Project Monitoring

1. The project monitor shall provide oversight of clean-up activities to ensure compliance with project specifications, tenants authorizations, and applicable rules and regulations. The project monitor shall be present on site during all cleaning activities. The project monitor shall coordinate all scheduling requirements for timely completion of the work (completion of work area preparation and cleaning activities within three (3) weeks. The project monitor shall maintain the inventory of valuable items in each unit as provided by tenants. A copy of the contractor requirements is attached. For additional and specific tasks, refer to this attachment.
2. The project monitor shall provide daily monitoring of all work activities to insure compliance with the scope-of-work, the applicable rules and regulations, and the contracts. This includes but is not limited to the verification of worker certification status, the use of proper engineering controls and appropriate work practices.

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3. The project monitor shall direct corrective actions when appropriate and shall be responsible to stop work until corrections are made. Findings must be reported immediately to DEP via telephone call. Written notification of observation and corrective actions must be received by the DEP within 48 hours of telephone call.
4. A final report shall be submitted to the DEP within 7 days of project completion. The report shall clearly identify the work performed in each unit and shall include all laboratory reports, chain-of-custody forms, field notes, copies of employee credentials (i.e. certificates), tenant and owner authorizations, etc.