



ATHENICA
ENVIRONMENTAL SERVICES INC.

45-09 Greenpoint Avenue
Long Island City, N.Y. 11104

Tel (718) 784-7490

333 RECTOR PLACE

December 09, 2002

United States Environmental Protection Agency (USEPA)
Region 2
290 Broadway
New York, NY 10007-1866

Attn: Mr. Eric Wilson-Quadrant Coordinator
Tel# (212) 637-3150
Fax# (212) 637-3105

Re: 333 Rector Place, Manhattan, NY
Evaluation Report for Building HVAC & Environmental Inspection for WTC Related Dust

Dear Mr. Wilson:

Athenica Environmental Services, Inc. and Dust Dusters performed Building HVAC & Environmental inspections on October 10 and 25, 2002.

Qualifications:

Dust Dusters (DD) is a NADCA certified corporation. Mr. Tony Gallo and Frank Troetti of DD performed the inspections of the HVAC and exhaust systems in conjunction New York State certified Asbestos Inspector Mrs. Theresa Vasquez of Athenica Environmental Services, Inc (AES).

Background:

333 Rector Place is a 15-story building 232 residential units managed by Rock Rose Corp. (212) 984-1734. The manager of the building is Mr. David Pian and his phone number is 212 /984-1734.

Post 9/11 Maintenance History:

No Post 9/11 Maintenance activity reports were available with the Building Management at the time of our inspection. A copy was e-mailed to us on December 03, 2002 and is included in the attachments.



**ATHENICA
ENVIRONMENTAL SERVICES INC.**

45-09 Greenpoint Avenue
Long Island City, N.Y. 11104

Tel (718) 784-7490
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December 09, 2002

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333 Rector Place , Manhattan, NY
December 09, 2002

Inspection Details:

As part of the survey, the following HVAC system types were inspected by the Mechanical and the Environmental Professionals and bulk samples were collected. All identification data and visual inspections are documented in the attached checklists.

- A. A total of 23 kitchen and bathroom exhaust fans located on the main roof.
- B. HVAC Unit located in the east side of the roof
- C. HVAC Unit located in the west side of the roof
- D. A/C#1 Unit located in the garage and serves the lobby area.
- E. A/C#4 Unit located in the garage, and serves the laundry room.
- F. Exhaust fan located in the basement and serves the basement.

Summary of Findings:

During our visual inspection of the various HVAC systems black dust with a film of white layer (more than 1/16th of an inch thick) was observed in the following systems along with their components.

Kitchen and bathroom exhaust units#12,1,2.Located on the roof. — 3 —

Exhaust fan located in the basement and serves the basement. — 1 —

(2)HVAC units servicing the hallways. — 2 H

A/C#4 Unit located in the garage, and serves the laundry room 1 H

This data is recorded in the Ventilation system evaluation forms attached.

Bulk samples were collected and analyzed by EMLS Analytical .The bulk samples tested negative for WTC related dust.

Scope of work:

The following systems along with their components need to be cleaned for WTC related dust.

Kitchen and bathroom exhaust units#12,1,2.Located on the roof.

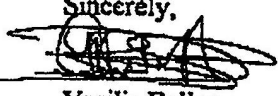
Exhaust fan louvers and its plenum, located in the basement and serves the basement.

(2)HVAC units servicing the hallways.

A/C#4 Unit located in the garage, and serves the laundry room

Should you require any further information, please feel free to contact me.

Sincerely,



Vasilis Bellos

Director of Operations

Attachments: 1) Ventilation System Evaluation forms.
2)EMSL chain of custodies & bulk samples results.
3)History of maintenance activities in the aftermath of 9/11/2001.

VENTILATION SYSTEM EVALUATION FORM

Part 1.0 General Information

Date of Evaluation: 10/20/25-09 Building contact name and phone: DAVID TAN 212-984-1734
 Evaluation Team (list name and affiliation): ROCK ROSE CORP.
THERESA VASQUEZ - ATHENICA (Environmental Professional)
Tony Gallo, Frank Inetti - DGT DUSTERS (HVAC/Electrical Professional)
 Building Address: 333 RECTOR PLACE Type of Facility (check all that apply):
NEW YORK, NY ☒ Residential
☐ Multi-use
☐ Other (describe)
 HVAC System Types (check all that apply) Number of residential units: 239 Number of floors: 15
☐ Unit ventilator (single residence unit) ☐ Wall/window AC unit (single residence unit)
☐ Fan coil unit (single residence unit) ☒ Central ventilation system
☐ Heat pump unit (single residence unit) ☒ Passive shaft/duct
☐ Other (describe)
 Location of outside air intake:
 Outside air intake accessible for inspection ☒ Y ☐ N (explain)

Part 2.0 Checklists

2.1 Ventilators, wall air conditioning units and window air conditioning units in common spaces

Ventilation System Identification: KITCHEN & BATHROOM EXHAUSTS TOTAL (23) UNITS
 Location: ROOF
 Access adequate for inspection of components: YES

System Components	System Component Substrate Material (sheet metal wrapped) (sheet metal lined) (fiberglass) (flexible connector) (double walled)	Dust/Dirt / Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Outside air intake louvers, grates and/or screens						
Outside air duct						
Outside air damper(s)						
Return air grille	<u>ALUMIN</u>					
Return air plenum	<u>SHEET METAL</u>			✓	<u>Y</u>	<u>20%</u>
Filter rack				✓	<u>Y</u>	<u>20%</u>
Filter media						
Coils (evaporator)						
Blower assembly	<u>SHEET METAL</u>					
Condensate drain pan				✓	<u>Y</u>	<u>20%</u>
In-line electrical resistance strip heaters (in supply ducts connected to unit ventilators)						
Fire dampers	<u>SHEET METAL</u>					
Turning vanes				✓	<u>Y</u>	<u>20%</u>
Supply air plenum or supply duct						
Supply air plenum or supply duct liner						
Supply air diffuser						

2.1 Ventilators, wall air conditioning units and window air conditioning units in common spaces (cont.)

Inspection of 10/25/02 - 333 Rector Place

Kitchen/Bathroom Ventilation Units

#13	GB-18-5-1463A	Normal buildup/black dirt
#14	GB-18-5-1463A	Normal buildup/black dirt
#12	GB-24-100-46-5A	Very dirty - white/grey dust - took sample
#1	GB-18-5-146-3A	Very dirty - white/grey dust - took sample
#2	GB-18-5-146-3A	Very dirty - white/grey dust - took sample
#3	GB-18-5-146-3A	Clean/No buildup
#5	GB-18-5-146-5A	Normal buildup/black dirt
#15	GB-18-5-146-5A	" "
#16	GB-24-7-147-4A	" "
#4	GB-10-4-016-5A	" "
#17	GB-24-7-147-4A	" "
#7	GB-18-5-146-3A	" "
#19	GB-24-7-147-4A	
#18	GB-24-10-046-5A	
#6	GB-10-1-016-5A	
#8 -	GB-14-3-175-4A	
#9 -	GB-10-1016-4A	
#20 -	GB-18-5-46-146-3A	
#26 -	GB-14-5-175-4A	
#25 -	GB-18-5-146-3A	
#27 -	GB-18-5-46-146-3A	
#10 -	GB-10-4-016-4A	
#21 -	GB-14-3-75-4A	" "

(2) Rooftop air package units Trane - Model SACC-C116A - ✓

Basement - Fresh Air Intake in boiler room (#2 boiler) - Greenheck ✓

Exhaust System - for compactor room - located in garage - Greenheck 908-10-4

AC-Self Contained Unit 0 Shil-Aire Model BA060-H3A (AC4) serves garage Laundry rm.

AC - self contained AC1 - Raud A/C serves lobby and cooling units (Shil-Aire) model CAA-060H3A

Other Information:

☒ Unit cycled prior to inspection	YES	☒ Color of dust/dirt/debris	BLACK/WHITE/GRAY
☐ Filter loading (general impression)	N/A	☐ Water damage	NONE OBSERVED
☐ Filter bypass (describe)	NO	☐ Visible suspect mold growth	NONE OBSERVED
☐ Abraded/delaminated acoustical lining	NONE OBSERVED	☐ Evidence of animal incursion (carcasses, feathers, fecal matter)	

General Impression: TOTAL EXHAUST UNITS 23 LOCATED ON THE ROOF.
 (3) UNITS ARE COVERED WITH MORE THAN 1/16 INCH DEPTH - BLACK/WHITE/GRAY DUST
 SAMPLES WERE COLLECTED AND SENT TO EMSL ANALYTICAL INC. FOR ANALYSIS.
 THE 3 UNITS ARE UNIT 1, #2, 12. SEE ATTACHED LIST.
 THE REST OF THE EXHAUST UNITS ARE COVERED WITH BLACK DUST.

2.2 Fan coil/ heat pump units in common spaces

Ventilation System Identification:

Location:

Access adequate for inspection of components:

System Components	System Component Substrate Material (sheet metal wrapped) (sheet metal lined) (fiberglass) (flexible connector) (double walled)	Dust/Dirt/Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Return air grille						
Return air plenum						
Filter rack						
Filter media						
Blower assembly						
Thermal coils						
Supply air plenum						
Supply air diffuser						

Other Information:

☐ Unit cycled prior to inspection	☐ Color of Dust/Dirt/Debris
☐ Filter loading (general impression)	☐ Water damage
☐ Filter bypass (describe)	☐ Visible suspect mold growth
☐ Abraded/delaminated acoustical lining	☐ Evidence of animal incursion (carcasses, feathers, fecal matter)

General Impression:

VENTILATION SYSTEM EVALUATION FORM**Part 1.0 General Information**

Date of Evaluation: 10/10/25/02	Building contact name and phone: DAVID PIAN 212-984-1734 ROCK ROSE COMPANY
Evaluation Team (list name and affiliation):	
THERESA VAZQUEZ - ATHENICA	(Environmental Professional)
TONY GALLO & FRANK TROETTI - DUCT DUSTERS	(HVAC/Electrical Professional)
	(Sheet Metal Professional)
Building Address:	Type of Facility (check all that apply):
333 Rector Place	☒ Residential
NEW YORK, NY.	☐ Multi-use
	☐ Other (describe)
	Number of residential units: 232 Number of floors: 15
HVAC System Types (check all that apply)	
☐ Unit ventilator (single residence unit)	☐ Wall/window AC unit (single residence unit)
☐ Fan coil unit (single residence unit)	☒ Central ventilation system
☐ Heat pump unit (single residence unit)	☒ Passive shaft/duct
☐ Other (describe)	
Location of outside air intake:	
Outside air intake accessible for inspection ☒ Y ☐ N (explain)	

Part 2.0 Checklists**2.1 Ventilators, wall air conditioning units and window air conditioning units in common spaces**

Ventilation System Identification: EXHAUST FAN						
Location: BASEMENT AND SERVES BASEMENT						
Access adequate for inspection of components: YES						
System Components	System Component Substrate Material (sheet metal wrapped) (sheet metal lined) (fiberglass) (flexible connector) (double walled)	Dust/Dirt / Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Outside air intake louvers, grates and/or screens						
Outside air duct						
Outside air damper(s)						
Return air grille	ALUMIN.			☒	☒	40%
Return air plenum	SHEET METAL			☒	☒	40%
Filter rack						
Filter media						
Coils (evaporator)						
Blower assembly	SHEET METAL			☒	☒	40%
Condensate drain pan						
In-line electrical resistance strip heaters (in supply ducts connected to unit ventilators)						
Fire dampers	SHEET METAL			☒	☒	40%
Turning vanes						
Supply air plenum or supply duct						
Supply air plenum or supply duct liner						
Supply air diffuser						

2.1 Ventilators, wall air conditioning units and window air conditioning units in common spaces (cont.)

Other Information:

☒ Unit cycled prior to inspection	YES	☐ Color of dust/dirt/debris	WHITE - GRAY
☐ Filter loading (general impression)	N/A	☐ Water damage	NONE
☐ Filter bypass (describe)	NO	☐ Visible suspect mold growth	NONE
☐ Abraded/delaminated acoustical lining	NONE	☐ Evidence of animal incursion (carcasses, feathers, fecal matter)	

General Impression: HEAVY ACCUMULATION INSIDE THE VAULT OF WTC related dust. WTC related dust is covering the Exhaust fan components. EXHAUST FAN OF THE GARAGE EXHAUST IN THE VAULT. NEXT TO THE FRESH AIR INTAKE (ACH#4) FOR LAUNDRY RM.

2.2 Fan coil/ heat pump units in common spaces

Ventilation System Identification:

Location:

Access adequate for inspection of components:

System Components	System Component Substrate Material (sheet metal wrapped) (sheet metal lined) (fiberglass) (flexible connector) (double walled)	Dust/Dirt/Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Return air grille						
Return air plenum						
Filter rack						
Filter media						
Blower assembly						
Thermal coils						
Supply air plenum						
Supply air diffuser						

Other Information:

☐ Unit cycled prior to inspection	☐ Color of Dust/Dirt/Debris
☐ Filter loading (general impression)	☐ Water damage
☐ Filter bypass (describe)	☐ Visible suspect mold growth
☐ Abraded/delaminated acoustical lining	☐ Evidence of animal incursion (carcasses, feathers, fecal matter)

General Impression:

Ventilation System Identification:

(2) HVAC -- TRANE

MODEL H SACC - C116A - EAST SIDE

Location: ROOF

Area Served: 25th FL - 2nd FL 4 ALWAYSMechanical room: clean Y N dry Y N stored chemicals/refuse Y NAccess adequate for inspection of components: YESAHU interior surfaces are visibly accessible: YES

System Components	System Component Substrate Material	Dust/Dirt/Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Outside air intake louvers, grates and/or screens	Alum. in		✓		YES	40%
Outside air duct	sheet metal		✓		YES	40%
Outside air damper(s)	sheet metal		✓		YES	40%
Return air grilles	Alum.		✓		YES	40%
Return air plenum						
Return air plenum damper						
Return air ducts	sheet metal		✓		YES	40%
Turning vanes						
Mixing chambers						
Filter rack(s)	sheet metal		✓		YES	40%
Filter banks/media	fiber glass		✓		YES	40%
Pre-heat coils	copper/Alum.		✓		YES	40%
Cooling coils						
Re-heat coils						
Humidification and/or air cleaning equipment						
Fire dampers						
In-line re-heat coils						
Acoustical blower housing lining	fiber glass		✓		YES	40%
Duct connectors						
Blower assembly including blower wheel, blower housing, air vanes, in-line noise attenuators, acoustical treatments (e.g. baffles, duct linings)	sheet metal		✓		YES	40%
Condensate drain pan	galvanized		✓		YES	40%
Condensate accumulator						
Supply air plenum	st					
Supply air plenum damper(s)						
Supply air ducts	sheet metal		✓		YES	40%
-High pressure - main trunk						
-Low pressure - branches						
Supply plenum or supply duct linings	fiber glass		✓		YES	40%
Supply air duct damper(s)						
Supply air diffusers						
Terminal boxes						
Open or ducted passive ventilation shaft(s)						
Other Information:						
☒ Unit cycled prior to inspection		<u>YES</u>		☒ Color of Dust/Dirt/Debris <u>WHITE / GRAY</u>		
☒ Filter loading (general impression)		<u>DIRTY</u>		☐ Water damage <u>NONE</u>		
☒ Filter bypass (describe)		<u>NONE</u>		☐ Visible suspect mold growth <u>NONE</u>		
☐ Abraded/delaminated acoustical lining		<u>NONE</u>		☐ Evidence of animal incursion (carcasses, feathers, fecal matter)		
				<u>NONE</u>		

Ventilation System Identification:
 (2) HVAC - TRANE MODEL SACC-C11GA - WEST SIDE
 Location: ROOF Area Served: 15th FL - 2nd FL HALLWAYS
 Mechanical room: clean Y N dry Y N stored chemicals/refuse Y N
 Access adequate for inspection of components: YES
 AHU interior surfaces are visibly accessible: YES

System Components	System Component Substrate Material	Dust/Dirt/Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Outside air intake louvers, grates and/or screens	Alumin.		✓		YES	40%
Outside air duct	sheet metal		✓		YES	40%
Outside air damper(s)	sheet metal		✓		YES	40%
Return air grilles	Alumin.		✓		YES	40%
Return air plenum						
Return air plenum damper						
Return air ducts						
Turning vanes						
Mixing chambers						
Filter rack(s)	sheet metal		✓		YES	40%
Filter banks/media	fiber glass		✓		YES	40%
Pre-heat coils	copper/Alumin.		✓		YES	40%
Cooling coils						
Re-heat coils						
Humidification and/or air cleaning equipment						
Fire dampers						
In-line re-heat coils						
Acoustical blower housing lining	fiber glass		✓		YES	40%
Duct connectors						
Blower assembly including blower wheel, blower housing, air vanes, in-line noise attenuators, acoustical treatments (e.g. baffles, duct linings)	sheet metal		✓		YES	40%
Condensate drain pan	galvanized		✓		YES	40%
Condensate accumulator						
Supply air plenum						
Supply air plenum damper(s)						
Supply air ducts	sheet metal		✓		N	
-High pressure - main trunk -Low pressure - branches						
Supply plenum or supply duct linings	fiber glass		✓		N	
Supply air duct damper(s)						
Supply air diffusers						
Terminal boxes						
Open or ducted passive ventilation shaft(s)						
Other Information:						
☑ Unit cycled prior to inspection <u>YES</u>		☑ Color of Dust/Dirt/Debris <u>WHITE/GRAY</u>				
☑ Filter loading (general impression) <u>DIRTY</u>		☐ Water damage <u>NONE</u>				
☑ Filter bypass (describe) <u>NO</u>		☐ Visible suspect mold growth <u>NONE</u>				
☑ Abraded/delaminated acoustical lining <u>NONE</u>		☐ Evidence of animal incursion (carcasses, feathers, fecal matter) <u>NONE</u>				

Central ventilation systems

Ventilation System Identification:
12. AC Unit
 Location: **GARAGE** Area Served: **LOBBY AREA**
 Mechanical room: clean Y N dry Y N stored chemicals/refuse Y N
 Access adequate for inspection of components: **YES**
 AHU interior surfaces are visibly accessible: **YES**

System Components	System Component Substrate Material	Dust/Dirt/Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Outside air intake louvers, grates and/or screens	ALUMIN		✓		N	
Outside air duct	SHEET METAL		✓		N	
Outside air damper(s)	SHEET METAL		✓		N	
Return air grilles	ALUMIN.		✓		N	
Return air plenum					N	
Return air plenum damper						
Return air ducts	SHEET METAL		✓		N	
Turning vanes						
Mixing chambers						
Filter rack(s)	SHEET METAL		✓		N	
Filter banks/media	FIBER GLASS		✓		N	
Pre-heat coils						
Cooling coils	COPPER/ALUM.		✓		N	
Re-heat coils						
Humidification and/or air cleaning equipment						
Fire dampers						
In-line re-heat coils						
Acoustical blower housing lining	FIBER GLASS		✓		N	
Duct connectors						
Blower assembly including blower wheel, blower housing, air vanes, in-line noise attenuators, acoustical treatments (e.g. baffles, duct linings)	SHEET METAL		✓		N	
Condensate drain pan	galvanized ALUM.		✓		N	
Condensate accumulator						
Supply air plenum						
Supply air plenum damper(s)						
Supply air ducts	SHEET METAL		✓		N	
-High pressure - main trunk						
-Low pressure - branches						
Supply plenum or supply duct linings	FIBER GLASS		✓		N	
Supply air duct damper(s)						
Supply air diffusers						
Terminal boxes						
Open or ducted passive ventilation shaft(s)						

Other Information:

☒ Unit cycled prior to inspection YES	☐ Color of Dust/Dirt/Debris BLACK
☐ Filter loading (general impression) CLEAN	☐ Water damage NONE OBSERVED
☐ Filter bypass (describe) NO	☐ Visible suspect mold growth NONE OBSERVED
☐ Abraded/delaminated acoustical lining NONE OBSERVED	☐ Evidence of animal incursion (carcasses, feathers, fecal matter) NONE OBSERVED

Ventilation System Identification:
ACU Unit

Location: **GARAGE**

Mechanical room: clean Y N dry Y N Area Served: **6.000000 LAUNDRY RM**

Access adequate for inspection of components: **YES**

AHU interior surfaces are visibly accessible: **YES**

System Components	System Component Substrate Material	Dust/Dir/Debris			Suspect WTC-Related Dust	
		None	Light (<1/16 inch depth)	Heavy (≥ 1/16 inch depth)	Present? (Y/N)	Estimate % of total dust loading
Outside air intake louvers, grates and/or screens	Alum		✓		YES	50%
Outside air duct	SHEET METAL		✓		YES	50%
Outside air damper(s)	SHEET METAL		✓		YES	50%
Return air grilles	ALUMINUM		✓		YES	50%
Return air plenum						
Return air plenum damper						
Return air ducts	sheet metal		✓		YES	50%
Turning vanes						
Mixing chambers						
Filter rack(s)	SHEET METAL		✓		YES	50%
Filter banks/media	ROCK GLASS		✓		YES	40%
Pre-heat coils	Copper / Alum.		✓		YES	40%
Cooling coils						
Re-heat coils						
Humidification and/or air cleaning equipment						
Fire dampers						
In-line re-heat coils						
Acoustical blower housing lining	fiber glass		✓		YES	40%
Duct connectors	sheet metal		✓		YES	40%
Blower assembly including blower wheel, blower housing, air vanes, in-line noise attenuators, acoustical treatments (e.g. baffles, duct linings)	sheet metal		✓		YES	40%
Condensate drain pan	galvanized					
Condensate accumulator						
Supply air plenum						
Supply air plenum damper(s)						
Supply air ducts	sheet metal		✓		YES	40%
-High pressure - main trunk						
-Low pressure - branches						
Supply plenum or supply duct linings	fiber glass		✓		YES	40%
Supply air duct damper(s)						
Supply air diffusers						
Terminal boxes						
Open or ducted passive ventilation shaft(s)						

Other Information:

☒ Unit cycled prior to inspection **YES**

☒ Filter loading (general impression) **DIRTY**

☐ Filter bypass (describe) **NO**

☐ Abraded/delaminated acoustical lining **NONE**

☒ Color of Dust/Dir/Debris **White & Cream**

☐ Water damage **NONE**

☐ Visible suspect mold growth **NONE**

☐ Evidence of animal incursion (carcasses, feathers, fecal matter) **NONE**

2.4 Sampling

Sampling is required if light to heavy dust is present that is not visually identified as WTC related (maximum 5 samples).

Samples Collected:	☒ Y ☐ N
Sample Locations:	
Location 1:	
Location 2:	Subsurface Vault East of Main Entrance - Fresh Air Intake
Location 3:	HVAC intake before filter - West Area - Roof
Location 4:	
Location 5:	

USEPA Contract Laboratory Program Generic Chain of Custody

Zip Code: 10280 Confirmation #: 002109104453 HPO Sequence ID: 2714C Floor/Apt: N/A Requester Name: Mr. David Pina Normalized Address: 333 Rector Place/ Project Leader: Theresa Vazquez Activity: Special Pre Monitoring Agency:		Date Shipped: 10/10/02 Carrier Name: Hand Delivered Airtail: EMSL Analytical Inc Shipped to: 307 West 38th Street New York NY 10018 (212) 250-0051		Originator ID: 404601535 10102002 17354014 Request Type: O BIN #: 100055	
Chain of Custody Record Reflected By: [Signature] (Date / Time) 2 [Signature] 10/10/02 3 [Signature] 4		Sample Signature: [Signature] Received By: [Signature] (Date / Time)			

SAMPLE No.	Cell Method/ SAMPLER	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE	RESIDENCE / CONTAINER AREA ID	SAMPLING LOCATION	VOLUME (L) AREA (cm2)	SAMPLE COLLECTION DATE/TIME	DURATION (hr)	CALC. Vol(L)
04453-283-252	Bulk Sample/ Theresa Vazquez	HVAC (Std)	343 (1)	333 RECTOR PLACE HVAC	Subsurface Vault East of Main Entrance		S: 10/10/02 E: 10/10/02	0.00	
04453-283-253	Bulk sample/ Theresa Vazquez	HVAC (Std)	344 (1)	333 RECTOR PLACE HVAC	West HVAC intake before filter		S: 10/10/02 E: 10/10/02	0.00	

RECEIVED
EMSL
10/10/02
MONT NJ

OCT 17 AM 10:10

RECEIVED

02 OCT 15 PM 8:02

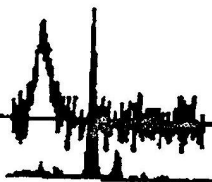
Shipper's Use Complete if	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: HVAC = HVAC (pH, NH ₄ ⁺ , SiO ₂)	TO Number: 10280-404601535-101502-0001		Shipment (ed)?
All flow rates are L/min			WTC

EMSL

Final Report To US EPA
World Trade Center Residential Study
Crystalline Minerals in Dust
by X-ray Diffraction

Submitted by
Dr. Samudra and Dr. Hu

EMSL Analytical, Inc. Westmont, NJ



List of Documents for EPA_WTC Residential Study

EMSL Billing No. 040216874

1. **EMSL Final Report. (Phase identity assumed but unconfirmed in EPA samples in this report)**
2. **EMSL Internal Chain of Custody**
3. **Client's Chain of Custody.**
4. **Summary Sheet listing Peak Area and Estimated Mineral Mass (ug) for six minerals (Quartz, Cristobalite, Tridymite, Gypsum, Calcite and Portlandite).**
5. **Bench Sheet**

Appendix

**Table of Protocols for X-ray Diffraction Study
Calibration Curves for six minerals**



EMSL Analytical, Inc. - 107 Haddon Avenue
Westmont, NJ. 08108
(856) 858-4800

Attention: **Terry Smith**
U.S.EPA
HQ Financial Services Division
1200 Pennsylvania Avenue
NW Maildrop 2734R
Washington, DC 20460

11/5/02

Project: **WTC**
Ref. Number: **360200914**

**Man Made Vitreous Fiber Analysis Performed
by Scanning Electron Microscopy (SEM),
and Polarized Light Microscopy (PLM).**

Sample ID	Description	Analyte	Concentration (%)	Analytical Sensitivity (%)	Comments
04453-283-252	Fibrous Dust Ball	Fibrous Glass	8%	~1%	pH of sample = 6.98
		Mineral Wool	<1%	~1%	
		Ceramic Fiber	ND	~1%	
04453-283-253	Fibrous Dust Ball	Fibrous Glass	8%	~1%	pH of sample = 7.08
		Mineral Wool	2%	~1%	
		Ceramic Fiber	ND	~1%	

Support data for pH analysis on attached page.

John Newton
Analyst

4 November, 02
Date of Analysis

Note: EMSL can only verify the results of the analysis in structures per area and not concentration that is based upon data obtained by our laboratory personnel.
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EMSL Analytical, Inc. - 107 Haddon Avenue
Westmont, NJ. 08108
(856) 858-4800

Attention: **Terry Smith**
U.S.EPA
HQ Financial Services Division
1200 Pennsylvania Avenue
NW Maildrop 2734R
Washington, DC 20460

11/5/02

Project: **WTC**
Ref. Number: **360200914**

**Man Made Vitreous Fiber Analysis Performed
by Scanning Electron Microscopy (SEM),
and Polarized Light Microscopy (PLM).**

Cal. 1
15:11:06 11/05/02
4.06 pH 22.2°C
pH 4.00 Calibration

Cal. 2
15:18:36 11/05/02
10.06 pH 22.2°C
pH 10.00 Calibration

SLOPE = 99 %

15:14:33 11/05/02
7.02 pH 22.4°C
pH 7.00 Calibration

15:10:20 11/05/02
7.08 pH 22.1°C
05:00-200-250

15:11:29 11/05/02
6.98 pH 22.2°C
05:00-200-250

15:12:45 11/05/02
6.96 pH 22.4°C
05:00-200-250

15:14:11 11/05/02
7.02 pH 22.4°C
05:00-200-250

15:15:40 11/05/02
7.02 pH 22.5°C
pH 7.00 Calibration

John Newton
Analyst

4 November, 02
Date of Analysis

*Note: EMSL can only verify the results of the analysis in structures per unit and not concentration that is based upon data obtained by non-laboratory personnel.
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Client: U.S.EPA

Ref. No.: 360200 9.4

Project ID: WTC

Sample ID: 04453-213-257

Analyst: J. Newton

Date: 4 Nov 02

Sample Description	252	253		
Identification	FG	mw		
Morphology	F	F	mw	
Color	cl	cl	cl	
Streak Color	cl	cl	cl	
Transparency	(mp) Trans: Opq	(mp) Trans: Opq	(mp) Trans: Opq	(mp) Trans: Opq
Crystalline	Y: N	Y: N	Y: N	Y: N
Pleochroism	Y: N	Y: N	Y: N	Y: N
SOE	0: - - -	0: - - -	0: - - -	0: - - -
Ext. L	—	—	—	—
RI - (λ)	< 1.605	< 1.605	< 1.605	< 1.605
RI - (n)	< 1.605	< 1.605	< 1.605	< 1.605
Other				
Org : In-org	0 : 1	0 : 1	0 : 1	0 : 1
Elemental Comp.	Si 2Ca	Si 2Ca	Si 2Ca	Si 2Ca
Diffraction	Ca 25°	Ca 25°	Ca 25°	Ca 25°
Concentration (%)	8	8	8	8
Comments				

N/A = not applicable; (Color - Cl = Clear, B = blue, G = grey, Gr = green, R = red, O = orange, Bl = black); [SOE - I = isotropic, + = positive, - = negative]
 [F = fibrous, A = acicular, T = tabular, L = lamellar, M = massive]; RI of synthetic fibers are reported in DS color based upon 1.550 liquid.

WksPID_Char.doc

EMSL Analytical, Inc.
107 Hudson Ave., Westmont, NJ 08108

PAGE 20

Order ID: 040216874

Attn:

U.S. EPA

HQ Financial Services Division
1200 Pennsylvania Avenue,
NW Maildrop 2734R
Washington, DC 20460

Fax:

Project: RESIDENTIAL: 333 Rector Place
Report Date: 10/25/02

Customer ID:
Customer PO:
Date Received:

USEPA30
2W-1104-NNLX
10/15/02 8:02 PM

EMSL Order: 040216874

EMSL Project ID:

Date Analyzed: 10/18-10/24/02

Silica, Crystalline Analysis of Bulk Dust Samples
Performed by X-Ray Diffraction (XRD) NIOSH Method 7500 (Modified), Issue 3, 1/15/98

Sample ID	Location	Sample Mass (g)	α -Quartz %	Cristobalite %	Tridymite %	Gypsum %	Calcite %	Portlandite %
04453-283-252	SURFACE VAULT	0.002	15.40	<1.00	<1.00	0.55	8.30	<1.00
04453-283-253	WEST HVAC	0.002	4.85	<1.00	<1.00	<0.50	<1.00	<1.00

Instrument Sensitivity: 0.005 mg: α -Quartz 0.010 mg: Gypsum 0.020 mg: Cristobalite/Tridymite/Calcite/Portlandite

< = Less than the stated value. The lowest reportable value is equivalent to the Analytical Sensitivity which is calculated from the lowest reproducible concentration of silica detectable by the instrument.

Anant Samudra, Ph.D.
Analyst



Stephen Siegel, CIH- Lab Manager
Or other approved signatory

AIHA Accredited - Laboratory ID #100192

Page 1 of 2

ATHENICA ENVIRONMENTAL

12/05/2002 09:29 12122320081

EMSL Analytical, Inc.
507 Haddon Ave. Weimant, NJ 08108

Order ID: 040216874

Attn: U.S. EPA
HQ Financial Services Division
1200 Pennsylvania Avenue,
NW Maildrop 2734R
Washington, DC 20460

Customer ID: USEPA30
Customer PO: 2W-1104-NNLX
Date Received: 10/15/02 8:02 PM

Fax: RESIDENTIAL- 333 Rector Place
Project: Report Date: 10/25/02

EMSL Order: 040216874
EMSL Project ID:
Date Analyzed: 10/18-10/24/02

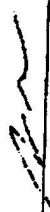
Silica, Crystalline Analysis of Bulk Dust Samples
Performed by X-Ray Diffraction (XRD) NIOSH Method 7500 (Modified), Issue 3, 1/15/98

Sample ID	Location	α-Quartz (mg)	Cristobalite mg	Tridymite mg	Gypsum mg	Calcite mg	Portlandite mg
Ref Std	0.026Q 0.050C 0.050T	0.027	0.062	0.100	N/A	N/A	N/A

Instrument Sensitivity: 0.005 mg: α-Quartz 0.010 mg: Gypsum 0.020 mg: Cristobalite/Tridymite/Calcite/Portlandite

< = Less than the stated value. The lowest reportable value is equivalent to the Analytical Sensitivity which is calculated from the lowest reproducible concentration of silica detectable by the instrument.

Anant Samudra, Ph.D.
Analyst


Stephen Siegel, CIH- Lab Manager
Or other approved signatory

AIHA Accredited - Laboratory ID #100192

EPA USEPA Contract Laboratory Program Generic Chain of Custody

Zip Code: 10280	Date Shipped: 10/10/02	Origination ID: 404601535 10102002 17354014
Confirmation #: D021109104453	Carrier Name: Hand Delivered	Request Type: O
IPQ Sequence ID: 27-40	Airbill:	SIN #: 1000055
Requester Name: Mr David Plan	Shipped to:	Chain of Custody Record
Home/ind Address: 333 Rector Place	EMSL Analytical Inc	Relinquished By (Date / Time)
Project Leader: Theresa Vazquez	307 West 38th Street	Signature: <i>Theresa Vazquez</i>
Agency: Special Pre Monitoring	New York NY 10016	Received By (Date / Time)
	(212) 293-0061	Signature: <i>Theresa Vazquez</i>

SAMPLE No.	Cell Method	ANALYSIS	TURBIDITY	TAG No./ PRESERVATIVE/ No. of Bottles	RESIDENCE / COMMON AREA ID	SAMPLING LOCATION	VOLUME (L) AREA (cm2)	SAMPLE COLLECTION DATE/TIME	DURATION (min)	CALC. Vol (L)
D4453-283-252	Bulk Samples/ Theresa Vazquez	HVAC (Std)		343 (1)	333 RECTOR PLACE HVAC	Subsurface Vault East of Main Entrance		S: 10/10/02 E: 10/10/02	0.00	
D4453-283-253	Bulk sample/ Theresa Vazquez	HVAC (Std)		344 (1)	333 RECTOR PLACE HVAC	West HVAC Intake before Filter		S: 10/10/02 E: 10/10/02	0.00	

02 OCT 15 PM 8:02

RECEIVED

RECEIVED
EMSL
10/10/02

OCT 17 AM 10:10

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Samples Signature(s):	Chain of Custody Seal Number:
Analysis Key: HVAC (Std)-MMVF-Silica			
Shipment Label?			

TR Number: 10280-404601535-101502-0001

PN provides preliminary results. Requests for preliminary results will increase analysis of costs.

Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA, 20191-3400 Phone 703/254-9348 Fax 703/254-9222

All flow rates are L/min

f.e.

WTC

F705.20 WTC Page 1 of 1

WTC_Residential Study

EMSL Billing # 040216874

333 Rector Place

		Quartz mg	Cristo mg	Tridymite mg	Gypsum mg	Calcite mg	Portlandite mg
1	04453-283-252	0.308	<DL	<DL	0.011	0.168	<DL
2	04453-283-253	0.097	<DL	<DL	<DL	<DL	<DL

Reference	True Value	0.026	0.050	0.050	0.010	0.030	0.050
	Measured	0.027	0.082	0.100	0.012	0.030	0.038
Peak Areas		Quartz Primary	Cristo Primary	Tridymite Primary	Gypsum Primary	Calcite Primary	Portlandite Primary
1	04453-283-252	1524.1	U.U	U.U	441.1	1115.0	U.U
2	04453-283-253	479.3	0.0	0.0	0.0	77.7	0.0

Reference		136.0	582.7	581.0	519.8	312.9	121.5
Corrected							
152900							
1.962067	slope	4.953	9.3758	5.8028	41.803	10.312	3.1625

Equations for obtaining mass of a phase (ug) from Peak Area (if that phase is assumed to be present).

Alpha Quartz (Primary)	$ug = (Peak\ Area) / 4.953$	DL = 5 ug
Cristobalite (Primary)	$ug = (Peak\ Area) / 9.3758$	DL = 20 ug
Tridymite (Primary)	$ug = (Peak\ Area) / 5.8028$	DL = 20 ug
Gypsum (Primary)	$ug = (Peak\ Area) / 41.803$	DL = 10 ug
Calcite (Primary)	$ug = (Peak\ Area) / 10.312$	DL = 20 ug
Portlandite (Primary)	$ug = (Peak\ Area) / 3.1625$	DL = 20 ug

EMSL SILICA WORKSHEET FOR USEPA PROJECTS (WIPES)EMSL Order ID# Q40216874

Client: USEPA Residential

Client Sample Number	EMSL#	Initial Weight (mg)	Final Weight (mg)	Volume Filtered (ml)	α -Quartz (mg)	Cristob. (mg)	Tridy. (mg)	Calcite	Gypsum	Portlandite
N/A	LB-									
N/A	QC-									
283-252	1									
283-252	2									
283-253	3				0.308	<0.1	<0.1	0.166	0.011	<0.1
	4				0.097	<0.1	<0.1	<0.1	<0.1	<0.1
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									

ORIGINAL SOLUTION VOLUME _____

2.0 mg filtered.

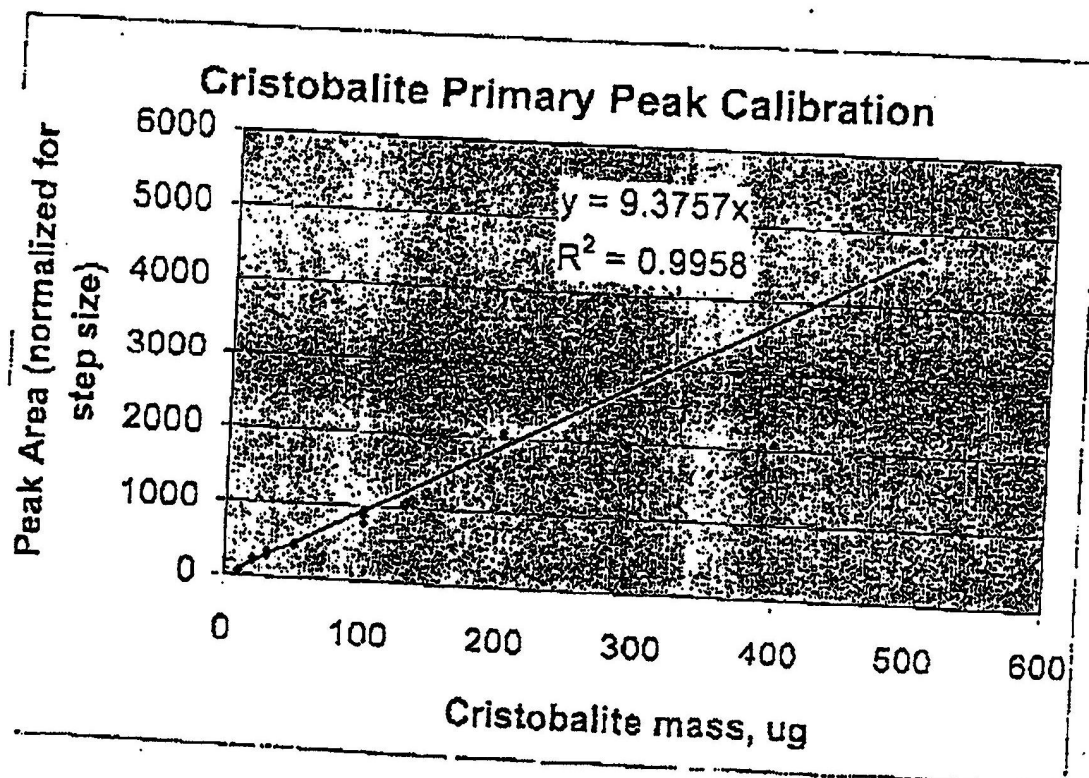
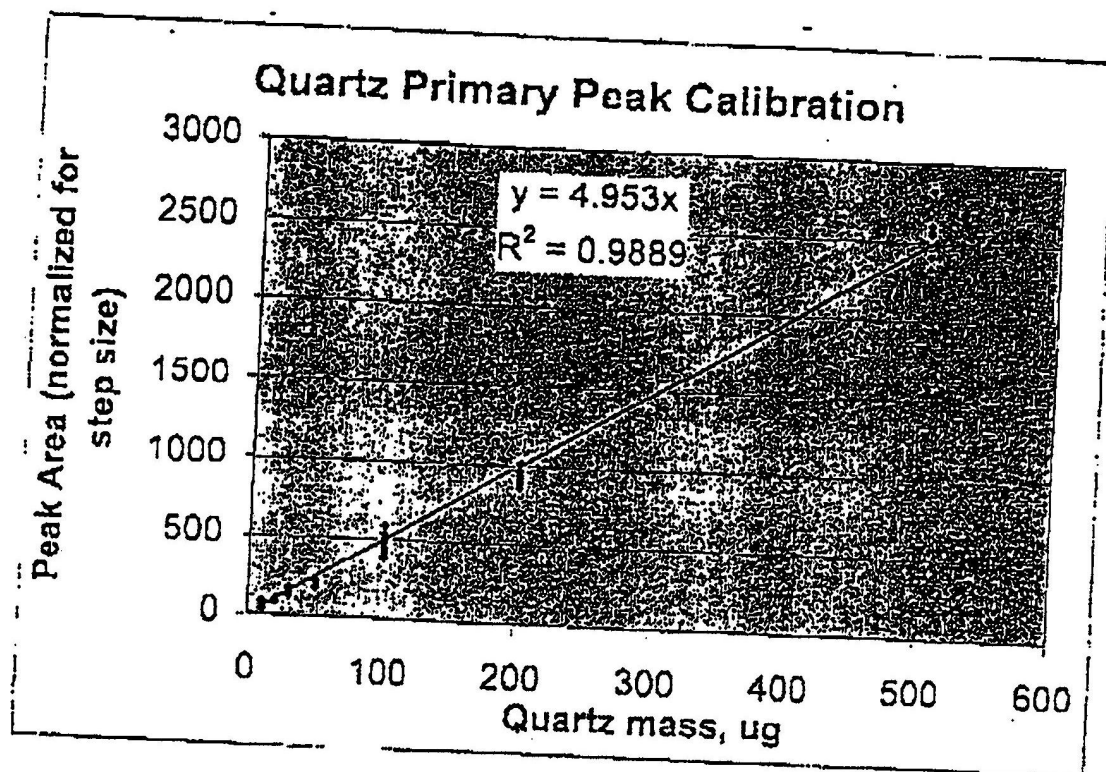
SILICA STANDARDSQUARTZ STANDARD WEIGHT(mg) 0.026CRISTOBALITE STANDARD WEIGHT(mg) 0.030TRIDYMITTE STANDARD WEIGHT(mg) 0.050XRD READING(mg) 0.027XRD READING(mg) 0.062XRD READING(mg) 0.100

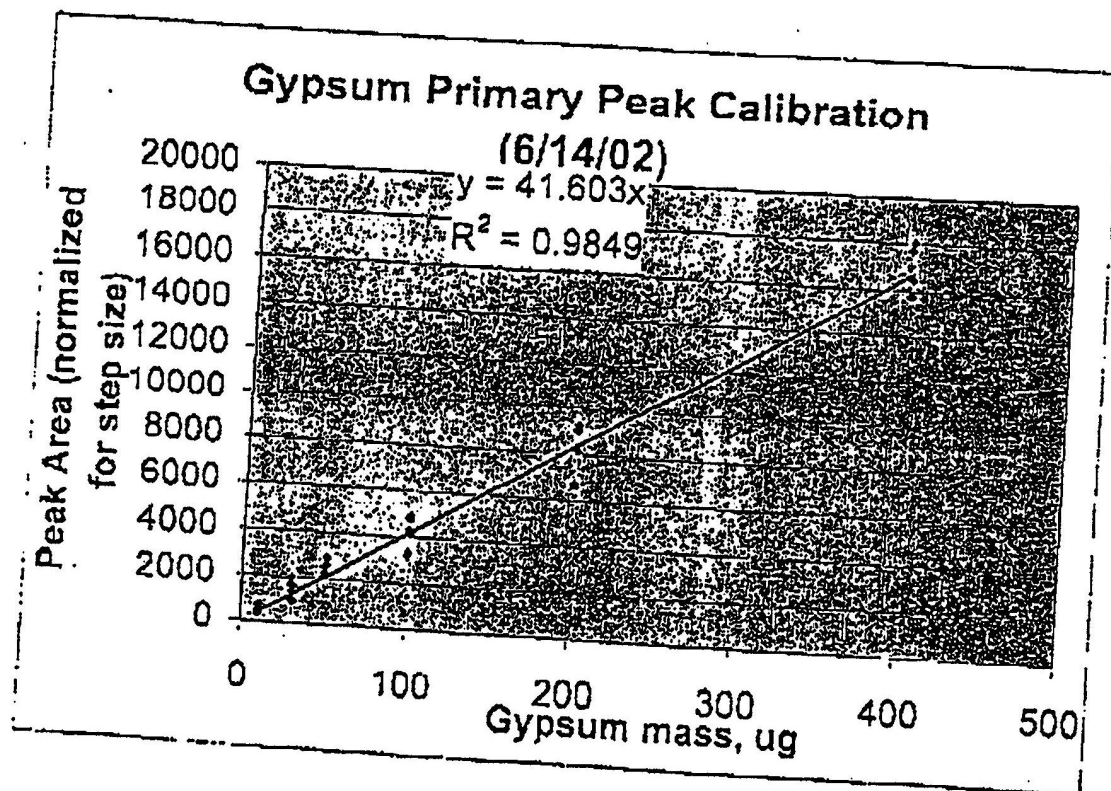
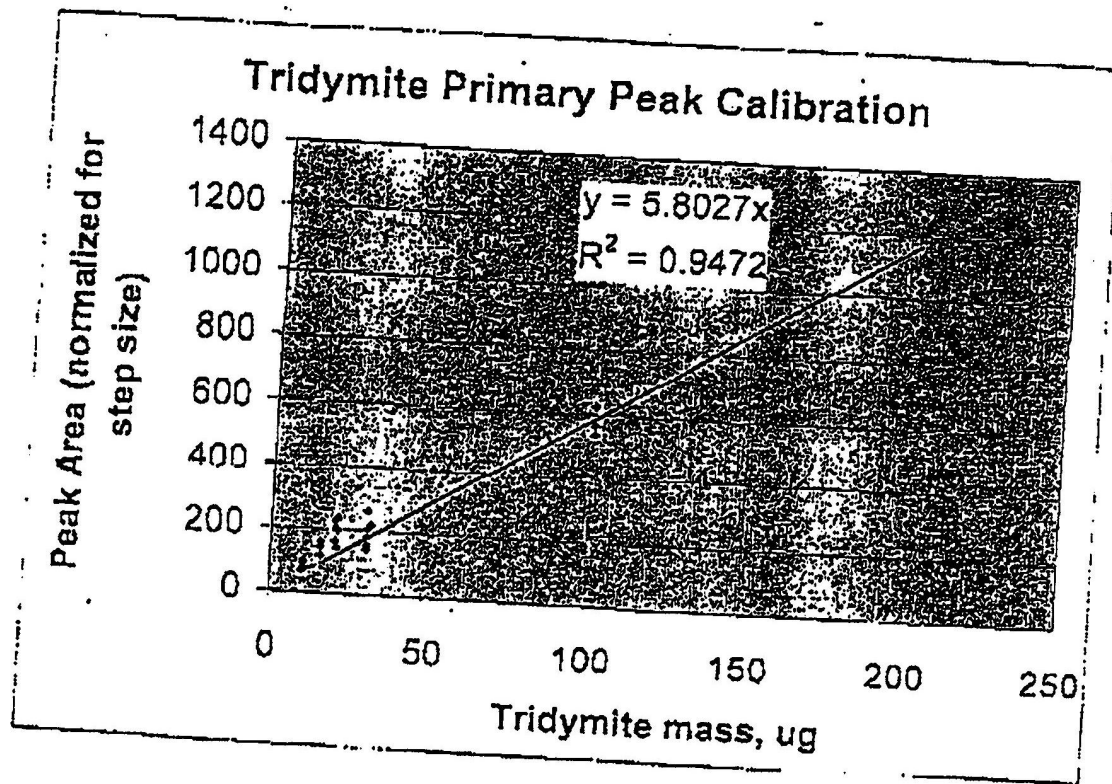
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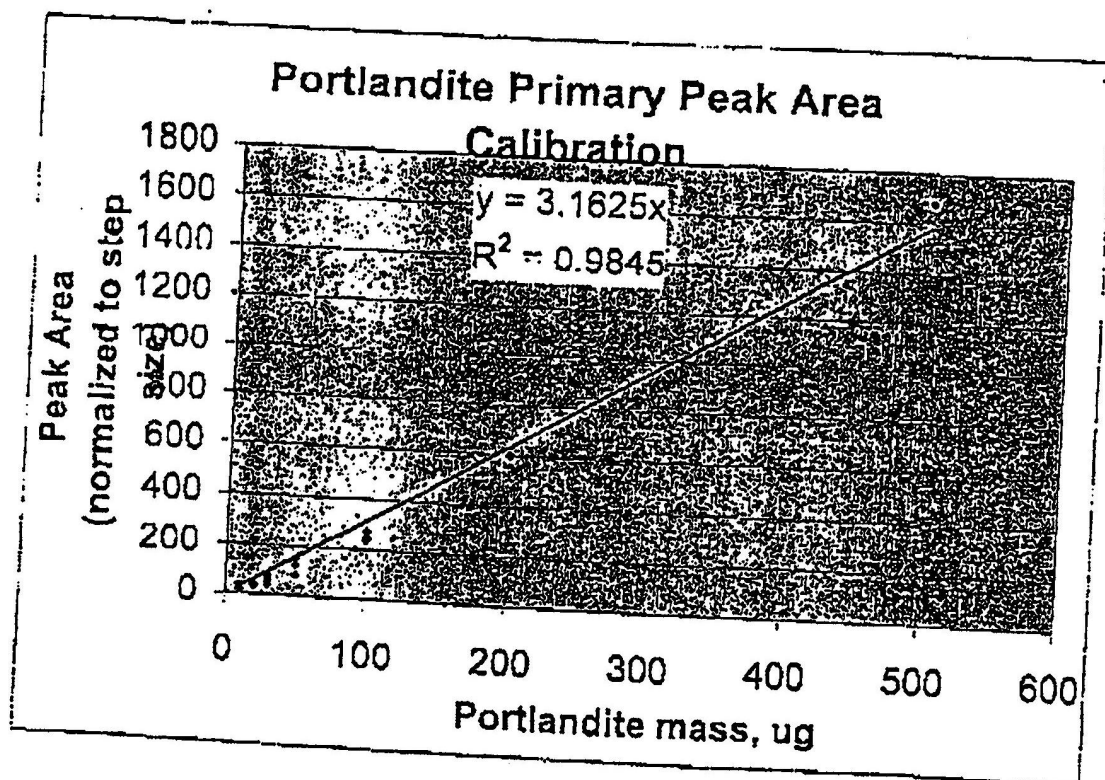
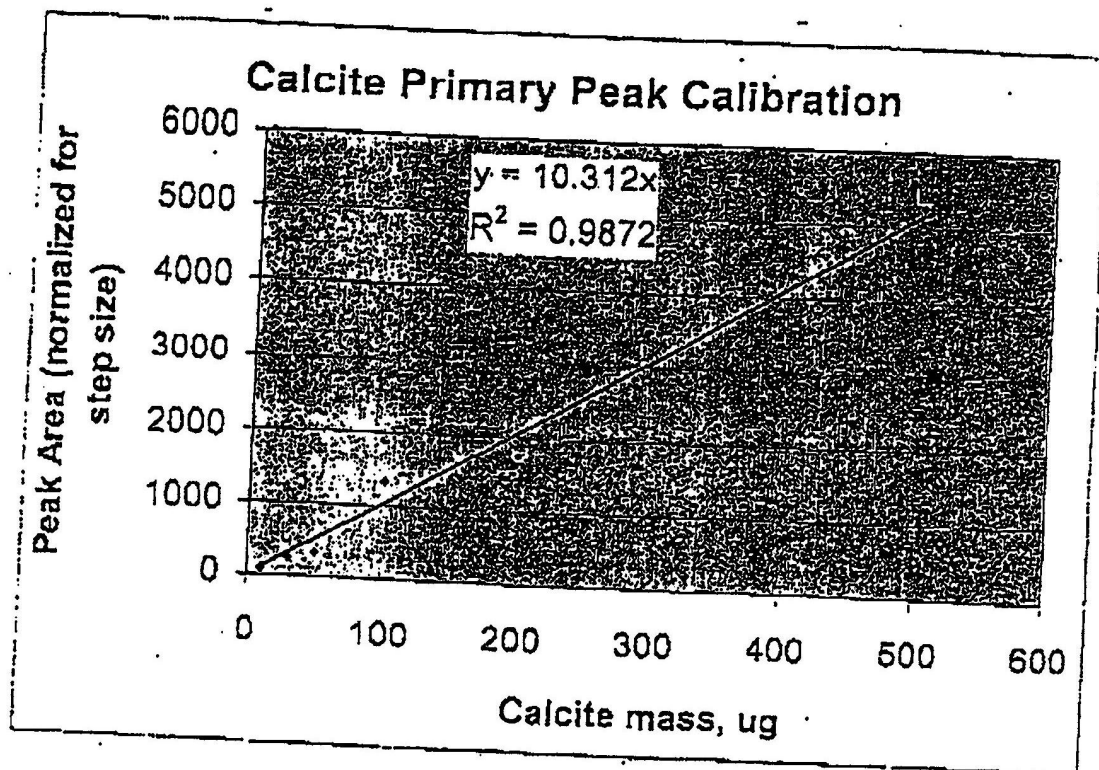
Protocols For XRD Analysis of 6 minerals

Mineral	Peak	Start Angle	Finish Angle	Step	Dwell, s	Calibration Equation To get ug Divide Area by 4.953	Detection Limit, ug 5
Quartz	Primary	26.0	27.5	0.02	10		
Cristobalite	Primary	20.5	23.0	0.02	10	9.3757	20
Tridymite	Primary	20.5	23.0	0.02	10	5.8027	20
Gypsum	Primary	10.7	12.5	0.02	10	41.603	10
Calcite	Primary	28.6	30.2	0.02	10	10.312	20
Portlandite	Primary	33.0	35.0	0.02	10	3.1625	20

All samples are analyzed on Rigaku D/MAX-2200 automated X-Ray machine using Cu- K-alpha radiation, operated at 38Kv-50ma.







EPA USEPA Contract Laboratory Program
Generic Chain of Custody

Zip Code: 10280
Confirmation #: 0021109104463
NPB Sequence ID: 27-40
Facility: Mr David Plan
Requestor Name: 333 Reactor Place/
Theresa Vazquez
Project Leader:
Activity: Special Pre Monitoring
Agency:

Date Shipped: 10/10/02
Carrier Name: Hand Delivered
ATB#: Shipped to:
EIMSL Analytical Inc
307 West 38th Street
New York NY 10018
(212) 233-0051

Chain of Custody Record

Relinquished By: Theresa Vazquez
Signature: Theresa Vazquez
Date/Time: 10/16/02
Resealed By: Theresa Vazquez
Signature: Theresa Vazquez
Date/Time: 10/16/02

Origination ID: 404601535 10102002 17354014
Request Type: O
BIN #: 1000055

SAMPLE No.	Colt Method SAMPLER	ANALYSIS TURNAROUND	TAG No./ PRESERVATIVE No. of Baffles	RESIDENCE/ COMMON AREA ID	SAMPLING LOCATION	VOLUME (L) AREA (cm2)	SAMPLE COLLECTION DATE/TIME	DURATION (hrs)	CALC. Vol (L)
04453-283-252	Bulk Sample/ Theresa Vazquez	HVAC (Std)	343 (f)	333 RECTOR PLACE HVAC	Subsurface Vent East of Main Entrance		S: 10/10/02 E: 10/10/02	0.00	
04453-283-253	Bulk sample/ Theresa Vazquez	HVAC (Std)	344 (f)	333 RECTOR PLACE HVAC	West HVAC intake before filter		S: 10/10/02 E: 10/10/02	0.00	

OCT 17 AM 10:10

RECEIVED
EIMSL
MON 10/14/02

O2 OCT 15 PM 8:02

RECEIVED

Shipment (for Case Complete) N	Samples to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analyte Key: HVAC = HVAC (W-MMVF-Silica)			Shipment Used?

TR Number: 10280-404601535-101502-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222

WTC
F25.28 WTC Page 1 of 1



**USEPA Contract Laboratory Program
Generic Chain of Custody**

Origination ID: 404601535 10102002 17354014
Request Type: 0
SIN #: 100055

Zip Code: 10280	Date Shipped: 10/10/02	Chain of Custody Record Relinquished By (Date / Time) Received By (Date / Time) 1. <i>Marquez</i> 10/16/02 <i>Eric Lopez</i> 2. <i>Eric Lopez</i> 3. <i>Eric Lopez</i> 4.	Sampler Signature: <i>Theresa Vazquez</i>
Confirmation #: 0021109104453	Carrier Name: Hand Delivered		Received By: <i>Eric Lopez</i>
HPD Sequence ID: 2714C	Airroll:		
Floor/Apt:	Shipped to: EMSL Analytical Inc 307 West 38th Street New York NY 10018 (212) 290-0051		
Requester Name: Mr David Pian			
Normalized Address: 333 Rector Place			
Project Leader: Theresa Vazquez			
Activity: Special Pre Monitoring			
Agency:			

SAMPLE No.	Coll Method/ SAMPLER	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ No. of Baffles	RESIDENCE / COMMON AREA ID	SAMPLING LOCATION	VOLUME (L) AREA (cm2)	SAMPLE COLLECTION DATE/TIME	DURATION	CALC. Vol (L)
04453-283-252	Bulk Sample/ Theresa Vazquez	HVAC (Std)	343 (1)	333 RECTOR PLACE HVAC	Subsurface Vault East of Main Entrance		S: 10/10/02 E: 10/10/02	02	0.00
04453-283-253	bulk sample/ Theresa Vazquez	HVAC (Std)	344 (1)	333 RECTOR PLACE HVAC	West HVAC Intake before filter		S: 10/10/02 E: 10/10/02	02	0.00

RECEIVED
EMSL
10/16/02

02 OCT 17 AM 10:10

02 OCT 15 PM 8:02

RECEIVED

Shipment for Case Complete * N	Sample(s) to be used for laboratory QC:	Additional Samples Signature(s):	Chain of Custody Seal Number:
Analysis Key: HVAC = HVAC (ph-MMVF-Silica)			Shipment Iced? _____

TD Number: 10280-404601535-101502-0001

All flow rates are L/Min

F.E

WTC

F75.28 WTC Page 1 of 1

Page 2

[illegible]

HYAC UNITS: SCHEME: (A)

(iv)

REMOVE AC UNITS & CHEMICALS/STEAM CLEAN OFF SITE: HEPA VACUUM SLEEVES & HEATING COILS: REINSTALL CLEANED UNITS.

NOTES: 1 REPLACE 8 SMOKE HEADS IN CELLAR
2 REPAIR LOBBY EMERGENCY POWER \$
3 REPAIR ONE TROUBLE ALARM

**REMOVE A/C UNITS, HEPA VACUUM
SLEEVES & HEATING COILS, HEPA
VACUUM POWER WASH UNITS ON SITE
& REINSTALL**

ITEM	333 RECTOR 228 APTS		
	Contr./Vendor /Consult.	Est date	\$ Est. /Actual
STRUCTURAL REVIEW	Rosenwasser	9/17/01	1,500
CON EDISON INSPECTION			
ELECTRICAL			
GAS			
PHONE SERVICE			
BOILER START UP			
ELEVATOR INSPECTION	Millar Elevators		
FIRE ALARM INSPECTION			
FIRE STANDPIPE SYSTEM	Almar Plumbing	9/27/01	200
FIRE SPRINKLER/STANDPIPE SYSTEM	Atlas	9/27/01	200
AIR QUALITY TESTING	GCI Environmental	9/28/01	9,150
AIR QUALITY TESTING	GCI Environmental	11/14/01	3,795
HEPA VACUUM PURCHASE			
HARDWARE, DUCT TAPE & POLY	Pearlgreen	10/5/01	371
BUILDING SECURITY & CLEAN UP			
BLDG MANAGER			
BUILDING STAFF			
OVER TIME			
OFFICE STAFF TIME (PO'S; PHONE CALLS; RECORD KEEPING; ETC.			
CORPORATE (KTE; AS; KPS; SE; etc.)			
MANAGEMENT (GR; DP; etc.)			
STAFF (DH; MR; RN; PF; etc.)			
ASBESTOS ABATEMENT	Advatex	9/26/01	67,274
ASBESTOS ABATEMENT	Advatex	10/10/01	1,537
FAÇADE CLEANING	Beacon Rest.	10,11/01	
HVAC UNIT CLEANING	Figlia & Sons	11/14/01	78,914
HVAC UNIT REPAIR	Figlia & Sons	11/14/01	12,297
PLANT REPLACEMENT WORK	For The Plants	11/14/01	17,683
WINDOW TRACK CLEANING	Bldg staff		
Sub-Tot.			\$ 192,921

41 RIVER TERRACE

Below is the current status of activities performed by building staff and outside contractors & consultants.

date
10/17/01

			Est. Duration
INSIDE WORK			
APARTMENTS			
HVAC FILTERS	Check/ clean/change	DONE	
HVAC UNITS **	Remove units; hepa vacuum sleeves; hepa vacuum/power wash units & reinstall	START 10/18	4 - 5 wks
** NOTE: Units temper & recirculate <u>inside</u> air. Outside air only circulates within the sleeve to transfer heat from the A/C coils to the outside. The HVAC units are installed to <u>prevent</u> outside air from entering the apartment.			
WINDOWS	Open windows were closed after the tragedy. Window tracks will be vacuumed at the time the HVAC units are cleaned.		
PUBLIC CORRIDORS & LOBBY	Carpet, tiles, etc.were vacuumed & mopped.	DONE	
	Walls & light fixtures were wiped with damp cloths	DONE	
SERVICE & PUBLIC AREAS	Refuse rms, laundry rms & fitness center were vacuumed, mopped & wiped with damp cloths.	DONE	
SERVICE & BACK OF HOUSE	Compactor, boiler, mechanical equipment rms, etc. were vacuumed, mopped & cleaned.	DONE	
OUTSIDE WORK			
FAÇADE & WINDOWS	Power wash & squeegee	Start 10/6	3 wks
PRIVATE TERRACES	Power wash	DONE	
RECREATION AREAS	Power wash pavers & furniture & equipment; wash plantings	DONE	
SIDEWALK & WALKWAYS	Power wash	DONE	
BUILDING WORK			
	STRUCTURAL REVIEW	REPORTED OK	
	ELECTRIC & GAS SERVICE	RESTORED	
	PHONES	OK	
	BOILER START UP	NORMAL	
	ELEVATOR INSPECTION	DONE	
	FIRE ALARM INSPECTION	DONE	
	AIR TESTING	DONE	
	DRAIN & REFILL WATER TANK	DONE	
	CHANGE BLDG EQUIP FILTERS	DONE	