NYC 9/11 Public Portal Document

ATC ENVIRONMENTAL, INC.
104 East 25th Street
New York, NY 10010

APPROVED NY STATE ELAP # 11172
ACCREDITED NVLAP Lab Code # 1187

Summary of TEM Results

ATC Associates Inc.
104 East 25th Street
New York, NY 10010
Mr. Michael Donovan

DATE: 10/11/01

Project/Site Identification: Bechtel, WTC Emerg., NY, NY
Turner/AMEC

CONCLUSION:

STATISTICAL SUMMARY

1) Inside Samples

TEM#	Project #	Volume(L)	S/mm^2	Asbestos Concentration S/cc	nom/m^3
		Average=	N/A	N/A	N/A

2) Outside Samples

TEM#	Project #	Volume(L)	S/mm^2	Asbestos Concentration S/cc	nom/m^3
5653- 60772	06	848	1.0	0.0050 *	
5653- 60773	08	848	0.0	0.0050 *	
5653- 60774	04	871	11.1	0.0049	
		Average=	3.7	0.0050	BH

3) Blanks

TEM#	Project #	S/mm^2	Asbestos Concentration S/cc	nom/m^3
5653- 60770	01	- - - - - - - - - -	Not Analyzed - - - - - - - - - -	
5653- 60771	02	- - - - - - - - - -	Not Analyzed - - - - - - - - - -	
	Average=	N/A	N/A	N/A

4) Value of T - Statistic : N/A

* None detected; concentration equivalent to analytical sensitivity assigned.

This test report relates only to the specific items cited in the analysis.
The analysis was carried out according to the approved TEM method. The laboratory is in compliance with the quality specified for the method.

This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

MP
Analyzed by:
Marek Peysakhov

Michael A. Gorycki, Ph.D.
Director of Electron Microscopy

04.002716

NYC-WTC_000246797

NYC 9/11 Public Portal Document

ATC Environmental, Inc.
104 East 25th Street
New York, New York 10010

ATC Associates Inc.
104 East 25th Street
New York, NY 10010

Approved N.Y. State ELAP #10671
ACCREDITED NVLAP Lab Code # 1187
Report Date: 10/10/01

ASBESTOS FIBER ANALYSIS BY TRANSMISSION ELECTRON MICROSCOPY (TEM)

With Fiber Identification by Selected-Area Electron Diffraction (SAED) and Energy-Dispersive X-RAY Spectroscopy (EDS

Method: AHERA Final Rule, EPA Federal Register (40 CFR, Part 763), Vol. 52, No. 210, October 30, 1987

Sample Identification

Project Site: Bechtel, WTC Emerg., NY, NY
Owner/AHERA -
Date Received: 10/11/01
Project Sample No.: 05
Air Volume: 848 liters
Filter Type: MCE 25 mm diam., Pore Size 0.45 um
Effective Area: 385 mm2

Analysis Parameters

TEM Sample No.: 5853 - 40772
Grid Openings Analyzed: 8
Average Grid Opening: 106.00 um
Total Area Analyzed: 0.0839 mm2
Analytical Sensitivity: 11.1 s/mm2
0.0950 s/cc

FIBROUS PARTICULATES ANALYZED

	Number Observed						CONCENTRATION		
	Single Fibers	Bundles	Clusters	Matrix Struct.	Total Struct.	Total Struct. per mm	Filter Struct/mm2	Filter Struct/cc	Air cem/ml
Chrysotile Asbestos	1	0	0	0	1	0	0.0	0.0000	1
Amphibole Asbestos	0	0	0	0	0	0	0.0	0.0000	1
Ambiguous	0	0	0	0	0	0	0.0	0.0000	1
Total asbestos (includes ambiguous structures)					0	0	0.0	0.0000	0
Non-Asbestos	0	0	0	0	0	0	0.0	0.0000	N/A
No Identification	0	0	0	0	0	0	0.0	0.0000	N.A
Totals (All Structures)					0	0	0.0	0.0000	N.A

The estimated uncertainty of this analysis is 1 standard deviation.

Non-asbestos fiber i.d. (EDS/SAED): None detected
Amphibole Asbestos Type: None detected

The Analysis was carried out in accordance with the approved TEM method.
This laboratory is in compliance with the quality specified for the method.

Analyzed by:

Marek Peysakhov

Report Reviewed by:

Michael A. Gorycki, Ph.D.
Director of Electron Microscopy

04.002717

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

NYC-WTC_000246798

ATC Environmental, Inc.
104 East 25th Street
New York, New York 10010

ATC Associates Inc.
104 East 25th Street
New York, NY 10010

Approved N.Y. State ELAP #10879
ACCREDITED NVLAP Lab Code # 1187
Report Date: 10/10/01

ASBESTOS FIBER ANALYSIS BY TRANSMISSION ELECTRON MICROSCOPY (TEM)

With Fiber Identification by Selected-Area Electron Diffraction (SAED) and Energy-Dispersive X-RAY Spectroscopy (EDS)
Method: AHERA Final Rule (EPA Federal Register 40 CFR, Part 763), Vol. 52, No. 210, October 30, 1987

Sample Identification

Project/Site: Bechtel, WTC Emerg., NY, NY
Turner/AMEC

Date Received: [illegible]

Project Sample No.: 36

Air Volume: [illegible] liters

Filter Type: MCE 25 mm diam. Pore Size: 0.45 um
Effective Area: 385 mm2

Analysis Parameters

TEM Sample No.: 3653 - 60771

Grid Openings Analyzed: 8

Average Grid Opening: [illegible] um

Total Area Analyzed: 0.0899 mm2

Analytical Sensitivity: [illegible] s/mm2
0.0050 s/cc

FIBROUS PARTICULATES ANALYZED

	Number Observed						CONCENTRATION		
	Single Fibers	Bundles	Clusters	Matrix Struct.	Total Struct.	Total Struct. >=5um	Filter Struct/mm2	Filter Struct/cc	Air ncm/ml
Chrysotile Asbestos	0	0	0	0	0	0	0.0	0.0000	0
Amphibole Asbestos	0	0	0	0	0	0	0.0	0.0000	0
Ambiguous	0	0	0	0	0	0	0.0	0.0000	0
Total asbestos (includes ambiguous structures)					0	0	0.0	0.0000	0
Non-Asbestos	0	0	0	0	0	0	0.0	0.0000	N/A
No Identification	0	0	0	0	0	0	0.0	0.0000	N/A
Totals (All Structures)					0	0	0.0	0.0000	N/A

The estimated uncertainty of this analysis is 1 standard deviation.

Non-asbestos fiber i.d. (EDS/SAED): None detected
Amphibole Asbestos Type: None detected

The Analysis was carried out in accordance with the approved TEM method.
This laboratory is in compliance with the quality specified for the method.

Analyzed by:

Marek Peysakhov

Report Reviewed by:

Michael A. Gorycki, Ph.D.
Director of Electron Microscopy

04.002718

NYC 9/11 Public Portal Document

ATC Environmental, Inc.
104 East 25th Street
New York, New York 10010

ATC Associates Inc.
104 East 25th Street
New York, NY 10010

Approved N.Y. State ELAP #10078
ACCREDITED NVLAP Lab Code # 1187
Report Date: 10/10/01

ASBESTOS FIBER ANALYSIS BY TRANSMISSION ELECTRON MICROSCOPY (TEM)

With Fiber Identification by Selected-Area Electron Diffraction (SAED) and Energy-Dispersive X-RAY Spectroscopy (EDS)
Method: AHERA Final Rule, EPA Federal Register (40 CFR, Part 763, Vol. 52, No. 210, October 30, 1987

Sample Identification | **Analysis Parameters**

Project/Site: Bechtel, WTC Emerg., NY NY
Turner/AMEC
Date Received: 10/13/01
Project Sample No.: 04
Air Volume: 871 liters
Filter Type: MCE 25 mm diam., Pore Size: 0.45 um
Effective Area: 385 mm2

TEM Sample No.: 3683 - 60774
Grid Openings Analyzed: 8
Average Grid Opening: 196.20 um2
Total Area Analyzed: 0.0899 mm2
Analytical Sensitivity: 11.1 s/mm2
0.0043 s/cc

FIBROUS PARTICULATES ANALYZED

	Number Observed						CONCENTRATION		
	Single Fibers	Bundles	Clusters	Matrix Struct.	Total Struct.	Total Struct >=5um	Filter Struct/mm2	Filter Struct/cc	Air s/cc/ml
Chrysotile Asbestos	1	0	0	0	1	0	11.1	0.0043	162
Amphibole Asbestos	0	0	0	0	0	0	0.0	0.0000	0
Ambiguous	0	0	0	0	0	0	0.0	0.0000	0
Total asbestos (includes ambiguous structures)					1	0	11.1	0.0043	162
Non-Asbestos	0	0	0	0	0	0	0.0	0.0000	N/A
No Identification	0	0	0	0	0	0	0.0	0.0000	N/A
Totals (All Structures)					1	0	11.1	0.0043	N/A

The estimated uncertainty of this analysis is 1 standard deviation.

Non-asbestos fiber i.d. (EDS/SAED): None detected
Amphibole Asbestos Type: None detected

The Analysis was carried out in accordance with the approved TEM method.
This laboratory is in compliance with the quality specified for the method.

Analyzed by:
Marek Peysakhov

Report Reviewed by:
Michael A. Gorycki, Ph.D.
Director of Electron Microscopy

04.002719

NYC-WTC_000246800

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ATC ASSOCIATES INC. – TEM ANALYSIS

Test sample No: 1-771 | Pulsar Type: MCE 25 mm | Operator: [illegible]

Subset Sel. No: 4 | Pulsar Area: 490 mm²

Instrument I.D.: EM-10-TEM | Mesh Dia: Cu-3 | Prep No.:

Screen Magnification: 16 x 20 | GO Area: 1.1464 mm² | Comments:

Mod. Voltage: 80 KV | No. of GO to be Analyzed: 3 | A thin Sample Tissue to fill a mesh.

GO. No.	GO. Coord.	Structure No.	Structure Type F	B	C	M	Length ≥0.5 um < 5 um	Length ≥ 5um	I.D. of Structure Chrys.	Amphibole	Nonasb.	N or ✓ Ambig./ND	EDS (Nonasb. Elements)
1	D1	450											
2	F1	— "											
3	P1	— "											
4	E1	— "											
5	E1	— "											
6	E1	— "											
7	P1	— "											
8	E1	— "											

Photo No. (from 1 in 5 asbestos-containing samples)

Identify all structures using EDS

Check diffraction for asbestos structures up to 70s/mm (1st 4)

Store all unrepeated spectra

STruct. = ≥ 0.5um & > 5:1 Aspect Ratio

N= Not Observed (EDS spectrum or diffraction pattern)

✓= Positive diffraction pattern properties conforming to laboratory identification criteria observed.

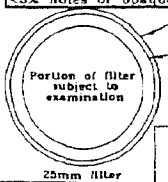
For chrysotile: 0.73nm spacing for (020) reflections, 0.53nm spacing for the layer line repeat, streaking of (110) and (130) reflections.

For amphiboles: 0.53nm layer line repeat, and approx. 0.5 ratio of non-twinned layer line spot spacing to layer line repeat distance (0.53nm).

✓= EDS spectrum conforming to laboratory identification criteria observed.

F= Single Fiber (1-3 intersections = 1-3 fibers)
B= Bundle (>3 fibers <1 fiber diameter apart)
C= Cluster (>3 intersections)
M= Matrix
NSD= No Structures Detected

Grid acceptance:
<50% undissolved filter, overlapped or folded
<10% particulate coverage >50% coverage
at least 20 unfolded or overlapped grid squares
<5% holes or opaque areas



Stopping Rules:
>20 s/G.O. or in 1st 4 G.O.

AMPHIBOLES
Amosite
Crocidolite
Anthophyllite
Tremolite
Actinolite

Totals

	F	B	C	M	≥ 5um
Chrysotile					
Amphibole					
Ambiguous					
Non-asbestos					
Non-identified					

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04.002720

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ATC ASSOCIATES INC. - TEM ANALYSIS

Lab Sample No: 21MC1 | Filter Type: MCE 25 mm | Operator: [illegible]

Client Sample No: 25 | Filter Area: 385 mm² | Item No: [illegible]

Instrument I.D.: EM 21 TEM | Mag I.D.: [illegible] | Comments: [illegible]

Screen Magnification: 10,000X | GO Area: 1 Field mm² | [illegible]

Acc. Voltage: 80 kV | GO's to be analyzed: 5 | Grids Stored: Slots 11 to 15 & mm²

GO. No.	GO. Coord.	Structure No.	Structure Type F	B	C	M	Length ≥0.5 um < 5 um	Length ≥ 5um	I.D. of Structure Chrys.	Amphibole	Nonasb.	N or ✓ Ambig./ND	EDS (Nonasb. Elements)
1	2D	1-S1											
2	2E	—											
3	2F	—											
4	2G	—											
5	3E	—											
6	4E	—											
7	5E	—											
8	6E	—											

Photo No. (from 1 in 5 asbestos-containing samples)

Identify all structures using EDS

Check diffraction for asbestos structures up to 70s/mm (1st 4)

Store all unrepeated spectra

Struct. = ≥ 0.5um & > 5:1 Aspect Ratio

N= Not Observed (EDS spectrum or diffraction pattern)

✓= Positive diffraction pattern properties conforming to laboratory identification criteria observed.
For chrysotile: 0.73nm spacing for (020) reflections. 0.53nm spacing for the layer line repeat, streaking of (110) and (130) reflections.
For amphiboles: 0.53nm layer line repeat, and approx. 3:1 ratio of non-twinned layer line spot spacing to layer line repeat distance (0.53nm).

✓= EDS spectrum conforming to laboratory identification criteria observed.

F= Single Fiber (1-3 intersections = 1-3 fibers)
B= Bundle (>3 fibers <1 fiber diameter apart)
C= Cluster (>3 intersections)
M= Matrix
NSD= No Structures Detected

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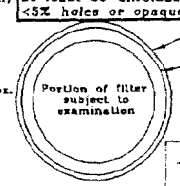
Grid acceptance:
<50% undissolved filler, overlapped or folded
<10% particulate coverage >50% coverage
at least 20 unfolded or overlapped grid squares
<5% holes or opaque areas



Stopping Rules:
>50 s/G.O. or in 1st 4 G.O.

AMPHIBOLES
Amosite
Crocidolite
Anthophyllite
Tremolite
Actinolite

Totals

	F	B	C	M	≥ 5um
Chrysotile					
Amphibole					
Ambiguous					
Non-asbestos					
Non-identified					

04.002721

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

NYC-WTC_000246802

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ATC ASSOCIATES INC. – TEM ANALYSIS

Lab Sample ID: 9377A
Client Spl. ID: 1A
Instrument I.D.: EM CM 12U
Screen Magnification: 19 -20K
Acc. Voltage: 80 kV

Filter Type: MCE 25 mm
Filter Area: 385 mm²
Grid I.D.: 4042
GO Area: 1.31E-3 mm²
No. GO to be Analyzed: 1

Operator: [illegible]
Disk ID:
Comments:
1 CM4 Aperture focused to 71 x mm²

GO. No.	GO. Coord.	Structure No.	Structure Type F	B	C	M	Length ≥0.5 um < 5 um	Length ≥ 5um	I.D. of Structure Chrys.	Amphibole	Nonasb.	N or ✓ Ambig./ND	EDS (Nonasb. Elements)
1	E1	NSD											
2	E1	–	–										
3	F1	–	–										
4	F1	–	–										
5	D2	–	–										
6	E2	–	–										
7	F2	–	–										
8	E2	1	✓				✓		✓				

Photo No. (from 1 in 5 asbestos-containing samples)

Identify all structures using EDS

Check diffraction for asbestos structures up to 70s/mm (1st 4)

Store all unrepeated spectra

Struct. = ≥ 0.5um & > 5:1 Aspect Ratio

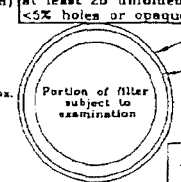
N= Not Observed (EDS spectrum or diffraction pattern)

✓= Positive diffraction pattern properties conforming to laboratory identification criteria observed.
For chrysotile: 0.73nm spacing for (020) reflections. 0.53nm spacing for the layer line repeat, streaking of (110) and (130) reflections.
For amphiboles: 0.53nm layer line repeat, and approx. 3:5 ratio of non-twinned layer line spot spacing to layer line repeat distance (0.53nm).

✓= EDS spectrum conforming to laboratory identification criteria observed.

F= Single Fiber (1-3 intersections = 1-3 fibers)
B= Bundle (>3 fibers <1 fiber diameter apart)
C= Cluster (>3 intersections)
M= Matrix
NSD= No Structures Detected

Grid acceptance:
<50% undissolved filter, overlapped or folded
<10% particulate coverage >50% coverage
at least 20 unfolded or overlapped grid squares
<5% holes or opaque areas



Stopping Rules:
>40 s/G.O. or in 1st 4 G.O.

AMPHIBOLES
Amosite
Crocidolite
Anthophyllite
Tremolite
Actinolite

Totals

	F	B	C	M	≥ 5um
Chrysotile	1				
Amphibole					
Ambiguous					
Non-asbestos					
Non-Identified					

04.002722

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ATC ASSOCIATES INC

AIR MONITORING DATA AND CHAIN OF CUSTODY FORM

Page 1 of 1

TURNAROUND TIME
[ ] 2 hrs [ ] 6 hrs [ ] 48 hrs [ ] Standard
[ ] 4 hrs [ ] 24 hrs [ ] 72 hrs [ ] Other

PROJECT INFORMATION

2/5 60770-60774

1. Client	2. Project Name	3. Project #	4. Project Monitor:	4c. Rotameter Number:
	2a. Project Address		4a. Air Sampler:	

5. Date	6. Abatement Location:	7. [ ] PCM (0.8 micron MCE)	8. [X] TEM (0.45 micron MCE)	9. Type:
		Cassette/Filter Manufacture	Cassette/Filter Manufacture	a. [ ] Background b. [ ] Pre-Abate c. [ ] Abatement d. [ ] Post-Abate e. [ ] OSHA f. [ ] Environmental g. [X] Ambient h. [ ] Other
		Lot #	Lot # 98307617	

DAILY AIR SAMPLE RECORD

10. Sample I.D. Number	11. Pump Number	12. Sample Location: 12a. IWA	12b. OWA	12c. Sample Coordinates	13. Time (24 hrs clock): 13a. Start	13b. End	13c. Total	14. Flow Rate (L/min): 14a. Start	14b. End	14b. Avg	15. Total Air Vol. (liters)	16. # Fibers/Fields Minus Blank	17. Fiber Conc. F/CC
				Field Blank									
				Field Blank									
				[illegible]	[illegible]	[illegible]	420	2.01	2.025	2.015	[illegible]		
				[illegible]	[illegible]	[illegible]	421	1.97	2.06	2.015	[illegible]		
				[illegible]	[illegible]	[illegible]	429	2.08	2.02	2.05	[illegible]		

CHAIN OF CUSTODY

18. Relinquished By	19. Received By	20. Date:	21. Time:
I		[illegible]	[illegible]
II			

LAB INFORMATION (ATC ELAP # 10879, ATC NVLAP # 1187)

22. Lab Name:	23. Date:	24. Time:
a. Analyzed By	[illegible]	[illegible]
b. QC By		
c. Lab Batch #:		

25. Microscope Make/Serial #:
[ ] Nikon Labophot 238913
[ ] Nikon Labophot 238917
[ ] Nikon Labophot 239079

Analysis Methodology
PCM - NIOSH 7400A
TEM - AHERA

26. ATC Project Manager

27. Result To:
Beeper/Phone #'s:

28. Comments:

WHITE - File YELLOW - Client/Report PINK - Lab GOLDENROD - Field

(1/00)

04.002723

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

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