EMS Laboratories
117 W. Bellevue Drive
Pasadena, CA 91105

NARRATIVE

November 8, 2010

Derrick Willis
Tronox LLC-Henderson
560 West Lake Mead
Henderson, NV 89015

SDG/EMS# 141276
Project: 2027.01, Tronox LLC Henderson,
560 West Lake Mead Drive, Henderson, NV
Client COC ID: 02027.01.2161

REFERENCE:	DAS Case No. 0769F	TDD No.: 07-10-0012
	Task No. 0361	P. O. No.: 0063941
	Tronox Project# 2027.01	NGE Tracking# 03
	AUI Task# 6	

EMS REPORT NO.: 141276

When the samples are analyzed in the TEM the recorded data includes the dimensions of the respirable fibers of the regulated asbestos types, namely, chrysotile, Amosite (cummingtonite/grunerite), tremolite, actinolite, crocidolite, and anthophylite. The fibers of importance are those included in the protocol fiber classification. The width of the protocol fibers is <0.4 um and the length is divided into two groups, 5 to 10 um and long fibers >10 um. The 95% Poisson Confidence interval for the observed concentration of fibers is also calculated. Other asbestos fibers and non-asbestos fibers with protocol dimensions are noted in the counting sheet. The problem regarding the loss of particles on polycarbonate filters has been eliminated except for very alkaline particles. There is no evidence that asbestos fibers are lost.

EMS Laboratories Inc.
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Attn: Derrick Wills
Tronox-LLC-Henderson
PO Box 55
Henderson, NV 89009

Phone: (947) 375-7004

Project: Tronox LLX Henderson, 560 W. Lake Mead Dr., Henderson, NV/2027.001

Date Sampled: 10/28/2010 15:45

Customer ID: TRNX26
Customer PO: 2027.001
Received: 9/22/2010 9:36 AM
EMS LAB No: 141276
Date Prepared: 11/2/2010 10:32 AM
Analysis Date: 11/3/2010 10:00 AM

Report Date: November 8, 2010

NIOSH 7402/ISO

DRAFT, MODIFIED ELUTRIATOR METHOD FOR THE DETERMINATION OF ASBESTOS IN SOILS AND BULK MATERIAL METHOD

EMS Laboratory Number: 141276
Customer Sample Number: SSAN5-05-0.00_1_BPC
Minimum Level of Analysis (chrysotile): CD
Minimum Level of Analysis (amphibole): ADX
Magnification used for fiber counting: 9,200 x
Aspect ratio for fiber definition: 3:1

Mass of Respirable Dust on Filter: 152 µg
Area of collection filter: 385 mm^2
Grid openings area: 0.0094 mm^2
Grid Openings Analyzed: 107
Min. Str. Length/Max Str. Diameter: >5/<0.4 microns

Analyst(s): Radha Singh

Dust Generator - Total Dried Sample Weight-72.7g
Not Used
Used in Tumbler

Soil % Moisture 8.8 %
Air Flow Rate Through ME Opening of Dust Generator: 1370
Air Flow Rate Through IST Opening of Dust Generator: 100
Estimate Total Air Flow Through Elutriator: 1470

Analytical Sensitivity: 2.52E+06 Structure /g PM 10
Limit of Detection: 7.54E+06 Structure /g PM 10

Test For Uniformity (Chi-Square results)

Structure Class	Min ID Level Required	Counts: Primary Str.	Counts: Total Str.	Density St/mm²	Poisson 95% Confidence Interval: Conc. Str/g PM10	Lower Limit Str/g PM10	Upper Limit Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	5	5	4.97	1.26E+07	4.09E+06	2.94E+07
Asbestos Structures>5um, ≤10um (Chrys)	CD	3	3	2.98	7.55E+06	1.56E+06	2.21E+07
Asbestos Structures>5um, ≤10um (Amph)	ADX	2	2	1.99	5.04E+06	6.10E+05	1.82E+07
Asbestos Structure >10um (Long)	ADX/CD	10	10	9.94	2.52E+07	1.21E+07	4.63E+07
Asbestos Structure >10um (Chrys)	CD	6	6	5.97	1.51E+07	5.55E+06	3.29E+07
Asbestos Structure >10um (Amph)	ADX	4	4	3.98	1.01E+07	2.74E+06	2.58E+07
Total Protocol Asbestos Structures	ADX/CD	15	15	14.91	3.78E+07	2.11E+07	6.23E+07
Protocol Asbestos Structures (Chrys)	CD	9	9	8.95	2.27E+07	1.04E+07	4.30E+07
Protocol Asbestos Structures (Amph)	ADX	6	6	5.97	1.51E+07	5.55E+06	3.29E+07
Total Protocol Non Asbestos Structures	NAM	2	2	1.99	5.04E+06	6.10E+05	1.82E+07

Approved by Technical Director

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Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm²
Report number :	141276	**Magnification:**	9200
Sample number:	SSAN5-05-0.00_1_BPC	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 11/2/2010 by Joel Paruli
Preparation Date: 11/2/2010 by Joel Paruli
Analysis Date: 11/3/2010 by Radha Singh

Asbestos Structures>5um, ≤10um (Chrys)	3
Asbestos Structures>5um, ≤10um (Amph)	2
Asbestos Structure >10um (Chrys)	6
Asbestos Structure >10um (Amph)	4
Protocol Asbestos Structures (Chrys)	9
Protocol Asbestos Structures (Amph)	6

Grid Openings	107
Mass - ug	152
Anlytical sensitivity	[redacted]

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions - mm		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Width	Length	Width	Length				
1A	C31	MD11	1		110	145	11.96	15.76				
		MF		1	3	110	0.33	11.96		Amosite		
1A	C34	None Detected										
1A	E31	None Detected										
1A	E34	None Detected										
1A	F31	None Detected										
1A	F34	None Detected										
1A	G33	None Detected										
1A	G36	None Detected										
1A	H33	F			8	100	0.87	10.87				Non Asbestos
1A	H36	None Detected										
1A	K33	None Detected										
1A	C41	None Detected										
1A	C44	None Detected										
1A	E41	None Detected										
1A	E44	None Detected										
1A	F43	None Detected										
1A	F46	None Detected										
1A	G43	MD11	2		62	115	6.74	12.50				
		MF		2	2	62	0.22	6.74		Amosite		
		F			14.5	120	1.58	13.04				Non Asbestos
		MD11	3		50	140	5.43	15.22				
		MF		3	1	100	0.11	10.87		Amosite		
1A	E51	None Detected										
1A	F56	None Detected										
1B	C31	None Detected										
1B	C34	None Detected										
1B	E31	None Detected										
1B	E34	None Detected										
1B	F31	MD21	4		90	160	9.78	17.39				
		MF		4	2.5	80	0.27	8.70		Amosite		
1B	F34	None Detected										
1B	G31	None Detected										
1B	G34	None Detected										
1B	C41	None Detected										
1B	C44	None Detected										
1B	E41	None Detected										
1B	E44	None Detected										
1B	F41	None Detected										
1B	G43	None Detected										
1B	G46	None Detected										
1B	F51	None Detected										
1B	F54	F			0.5	60	0.05	6.52				Non Asbestos

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Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total			Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
1B	G51	None Detected										
1B	H53	None Detected										
1B	H56	None Detected										
1C	C23	None Detected										
1C	C26	None Detected										
1C	E34	None Detected										
1C	F31	None Detected										
1C	F34	F			8	70	0.87	7.61				Non Asbestos
1C	G31	None Detected										
1C	G34	None Detected										
1C	H31	F	5	5	3.5	122	0.38	13.26		Amosite		Double
		F	6	6	2.5	112	0.27	12.17	CD	Chrysotile		
		F			15	70	1.63	7.61				Non Asbestos
1C	C33	F	7	7	1.5	108	0.16	11.74	CD	Chrysotile		
1C	C36	F	8	8	1.5	280	0.16	30.43	CD	Chrysotile		
		MD11			30	100	3.26	10.87				
		MF			8	90	0.87	9.78				Non Asbestos
1C	E33	None Detected										
1C	E36	None Detected										
1C	F33	None Detected										
1C	F36	MD11			38	80	4.13	8.70				
		MB			3.8	80	0.41	8.70	CD	Chrysotile		
1C	G33	None Detected										
1C	G36	None Detected										
1C	F41	None Detected										
1C	F44	None Detected										
1C	G41	None Detected										
1C	G44	None Detected										
1C	E51	None Detected										
1C	E54	None Detected										
1C	F51	None Detected										
1D	C23	None Detected										
1D	C26	None Detected										
1D	E34	None Detected										
1D	F31	None Detected										
1D	F34	F			10	50	1.09	5.43				Non Asbestos
1D	G31	None Detected										
1D	G34	None Detected										
1D	H33	None Detected										
1D	H36	MD11	9		40	150	4.35	16.30				
		MF		9	0.5	60	0.05	6.52	CD	Chrysotile		
1D	C41	None Detected										
1D	C44	F	10	10	0.5	60	0.05	6.52	CD	Chrysotile		
1D	E41	F	11	11	2.5	95	0.27	10.33	CD	Chrysotile		
1D	E44	None Detected										
1D	F41	None Detected										
1D	F44	None Detected										
1D	C51	None Detected										
1D	C54	None Detected										
1D	E51	None Detected										
1D	E54	None Detected										
1D	E36	None Detected										
1D	F53	None Detected										
1D	F56	None Detected										
1D	G53	None Detected										

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Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total			Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
1E	F31	MD21	12		40	360	4.35	39.13				
		MB		12	2.5	360	0.27	39.13	CD	Chrysotile		
		MD11	13		45	105	4.89	11.41				
		MF		13	1.5	105	0.16	11.41		Amosite		Double
1E	F34	None Detected										
1E	E31	None Detected										
1E	F34	None Detected										
1E	G31	None Detected										
1E	G34	MD11	14		55	138	5.98	15.00				
		MB		14	2	138	0.22	15.00	CD	Chrysotile		
1E	H31	None Detected										
1E	H34	MD11			90	190	9.78	20.65				
		MF			4.5	190	0.49	20.65		Amosite		
		MD11			40	140	4.35	15.22				
		MF			1	110	0.11	11.96				Non Asbestos
1E	E33	None Detected										
1E	E36	None Detected										
1E	F33	MD11	15		30	70	3.26	7.61				
		MF		15	1	70	0.11	7.61	CD	Chrysotile		
1E	F36	None Detected										
1E	G33	None Detected										
1E	G36	None Detected										
1E	H33	None Detected										
1E	E41	None Detected										
1E	E44	None Detected										
1E	F43	None Detected										
1E	F46	None Detected										
1E	G43	None Detected										
1E	G46	None Detected										

Elutriator Data

Date: 11/02/10 Client: NORTHGATE

Lab #: 141276

Sample ID: SSAN5-05-0.00-01BPC Sample weight (g): 72.7

Time air flow started: 700 Tumbler rpm: 30 * (see Below)

IST Flowmeter (mL/min): 100 ME Flowmeter (mL/min): 1370

Filter No.	Start Time	Tested flow rate (mL/min)	Final Filter Wt (mg)	Initial Filter Wt (mg)	Dust Weight (mg)	Time Value (min)	Avg. rate of deposition (ug/min)	Optimal time (min)	
1	900	180	0.03327	0.02522	8.05	30			~~60%~~ OK
2	930		0.02859	0.02509	3.50	20			60% loss
3	950		0.03670	0.02515	11.55	30			OK
4	1020		0.03465	0.02470	9.95	25			20% loss
5	1045		0.03994	0.02461	15.33	30			OK
6	1115		0.03022	0.02511	5.11	15			30% loss
7	1130								
8									
POLYCARBONATE PELLETS									
	Start Time	End Time					Dep. Rate	Estiimate	
1	940	949	4.777	4.676	0.101	~~2½~~ 9			
2	1003	1020	4.862	4.648	0.214	17			← 45 Rpm
3	1032	1044	4.875	4.723	0.152	12			
4	1056	1111	4.952	4.607	0.390	15			
5	1120	1128	4.819	4.670	0.149	8			
6				4.704					
7									
8									
9									
10									

* RAISE RPM TO 45 @ 1025

11-2-10

#SSAN5-05-0.00-01-BPC

dish wt.	19.24 g	
dish + S	119.26	(Initial wt. 100.02 g)
6:45 - 7:45	111.20	(91.96 g)
9:00 - 10:00	111.16	(Final wt. 91.92 g)

$$\%\ \text{Moisture} = 100 \times \frac{100.02 - 91.92}{91.92} = 8.8\ \%$$

#SSAN4-01-0.00_01_BPC

dish wt.	31.47 g	
dish + S	131.54	(Initial wt. 100.07 g)
6:45 - 7:45	127.12	(95.65 g)
9:00 - 10:00	127.10	(Final wt. - 95.63)

$$\%\ \text{Moisture} = 100 \times \frac{100.07 - 95.63}{95.63} = 4.64\ \%$$

#SSAP8-02-0.00_01_BPC

dish wt.	31.44	
dish + S	131.71	(Initial wt. = 100.27 g)
6:45 - 7:45	123.02	(91.58 g)
9:00 - 10:00	122.61	(91.17 g)
12:15 - 1:15	122.59	(Final wt. 91.15 g)

$$\%\ \text{Moisture} = 100 \times \frac{100.27 - 91.15}{91.15} = 10.0\ \%$$

BP

Copy

Count (Page of) NIOSH 7402/ISO

Prep Time: 1200-1230

Report number: 141276
Sample number: SSAN5-05-0.00-01 BPC
File name: Northgate
Sample Description: 152 : mg

Filter Type: PC 385 mm2
Date Sample was Run: 11/2/10

Magnification: 9,200 X

Preparation date: 11-2-10 By JAP
Analysis date: 11-3-10 By 12S
(A): ADX, ADQ

Grid opening dimension: 0.0094 mm²
Level of Analysis: (C): CD, CDX

Grid loading Moderate Condition of Grid good

Grid	Grid Opening	Number of structures Primary	Number of structures Total	Class	Type of Structure	Width mm	Length mm	Comments
1A	C3-1				MD11	110	145	amosite EDS #35
					MF	3	110	
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	G3-3					5		
	G3-6							
	H3-3				E	8	140	Non asb.
	H3-6							
	K3-3							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-3							
	F4-6							
	G4-3				MD11	62	115	amosite EDS
					MF	2	62	
					E	14.5	120	Non asb
					MD11	50	140	amosite EDS
					MF	1	100	
	F5-1							
	F5-6							
1B	C3-1							
	C3-4							
	E3-1							
	E3-4							

EM-10A (2002)

TEM Asbestos Structure Count (Page of)

Report number: 141276 SAMPLE NO: SSANS-05-0-00-01BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
D	F3-1				MD2I	90	160	amosite. EDS
					MF	25	80	
	F3-4							
	G3-1							
	G3-4							
	F4-1							
	G4-4							
	E4-1							
	E4-4							
	F4-1							
	G4-3							
	G4-6							
	E5-1							
	F5-4							
	G5-1							
	H5-3							
	H5-6				IF	0.5	60	EDS chrysotile
C	C2-3							
	C2-6							
	E3-4							
	E3-1							
	E3-4				IF	8	70	Nonasbestos
	h3-1							
	H3-4							
	H4-1				F	3.5	12*	double EDS amosite
					IF	2.5	112	chrysotile
					IF	1.5	70	Nonasbestos
	C3-3				IF	1.5	112	chrysotile
	C3-6				IF	1.5	280	chrysotile
					MDII	30	140	Nonasbestos
					MF	9	90	
	E3-3							

TEM Asbestos Structure Count (Page of)

Report number: 141276 SAMPLE NO: SSAN5-05-0:00-01 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1C	E3-6							
	E3-3							
	I-3-6							
					MD11	3.8	80	chryso
					MB	3.8	80	
	G33							
	G2-6							
	E4							
	E4-4							
	G4-1							
	G4-4							
	E5-1							
	E5-4							
	I-5-1							
1D	C2-3							
	C2-6							
	E3-4							
	E3-1							
	F3-4				I-	10	50	Non asbs
	G3-1							
	G2-4							
	H3-3							
	I-2-6				MD11	40	150	Chryso.
					MI-	0.5-	60	
	C4-1							
	C4-4				F	0.5-	60	chryso.
	E4-1				F	2.5-	95-	chryso.
	E4-4							
	I-E4-1							
	F4-4							
	C5-1							
	C5-4							
	E5-1							
	E5-4							

TEM Asbestos Structure Count (Page of)

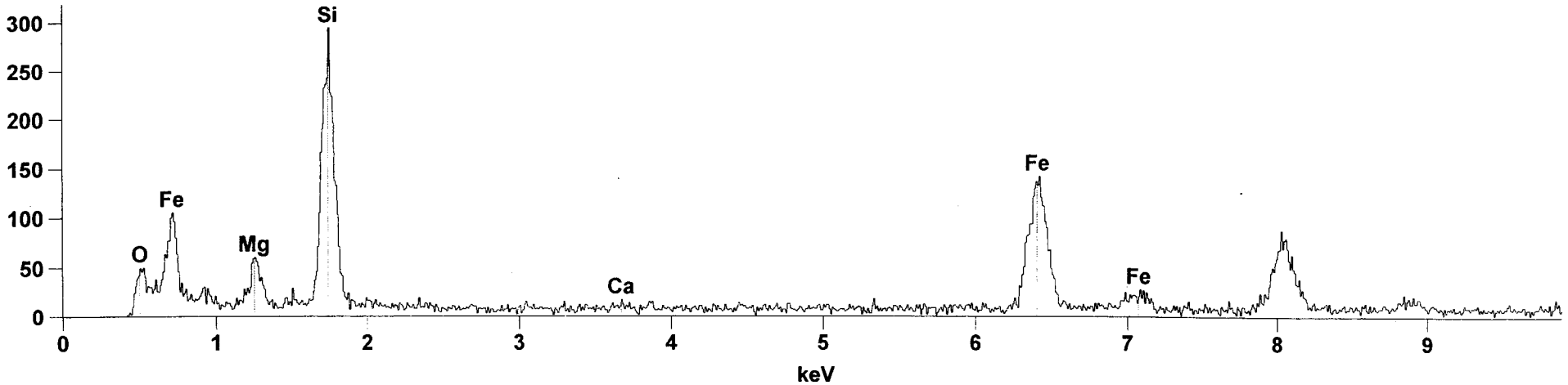
Report number: 141276 SAMPLE NO: SSAN5-05-0:00-01BPC x 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1D	E3-6							
	F5-3							
	F5-6							
	G5-3							
1E	F3-1				MD21	40	360	Chryso.
					MB	2.5	360	
					MD11	45	105x	double EDS amosite
	E3-4				MF	1.5	105^	
	E3-1							
	F3-4							
	G3-1							
	G3-4				MD11	55	138	Chryso
					MB	2	138	
	H3-1							
	H3-4				MD11	90	190	EDS amosite
					MF	4.5	190	
					MD11	40	140	Non asb.
					MF	1	110	
	E3-3							
	E3-6							
	F3-3				MD11	30	70	Chryso.
					MF	1	70	
	F3-6							
	G3-3							
	G3-6							
	H3-3							
	E4-1							
	E4-4							
	F4-3							
	F4-6							
	G4-3							
	G4-6							

Project: New Project

Full scale counts: 294

141276-SSANS5-05-00001BPA-C3-1



Wed Nov 03 10:51:32 2010
Gaussian Fit With Standards Chi Squared:2.012
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:17.4 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

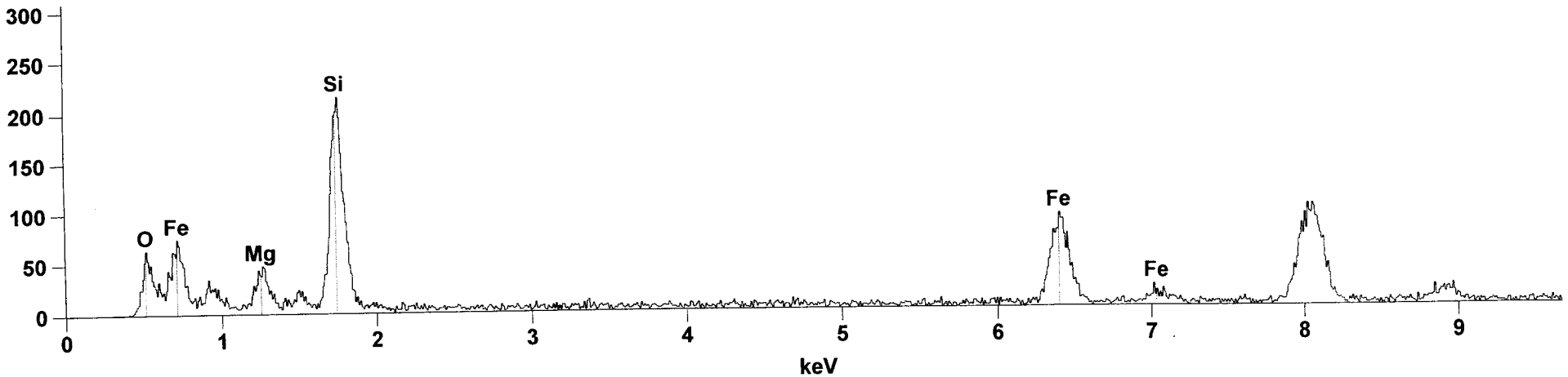
Quantitative Results 141276-SSANS5-05-00001BPA-C3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	542	12.27	---	17.94	+/- 0.79
Si K	2752	41.54	---	52.54	+/- 1.03
Ca K	33	0.55	---	0.49	+/- 0.21
Fe K	2160	45.64	---	29.04	+/- 0.67
Total		100.00		100.00	

Project: New Project

Full scale counts: 284

141276-SSANS5-05-00001BPC-A-G4-3



Wed Nov 03 10:58:50 2010
Gaussian Fit With Standards Chi Squared:2.044
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:31.4 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

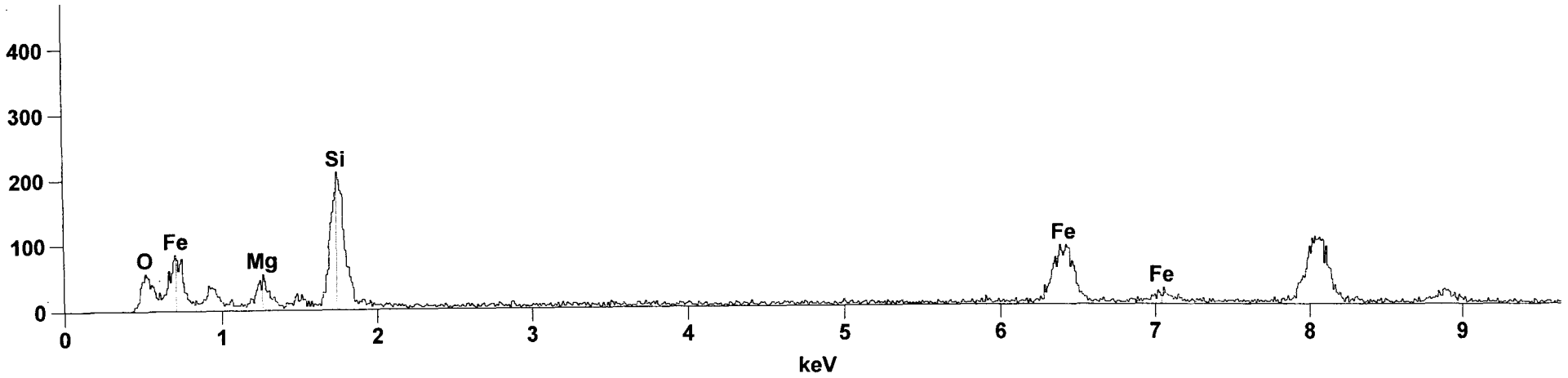
Quantitative Results 141276-SSANS5-05-00001BPC-A-G4-3

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	436	14.00	---	19.71	+/- 0.99
Si K	2128	45.55	---	55.50	+/- 1.25
Fe K	1350	40.45	---	24.79	+/- 0.72
Total		100.00		100.00	

Project: New Project

Full scale counts: 434

141276-SSANS5-05-00001BPC-A-G4-3(1)



Wed Nov 03 10:59:52 2010
Gaussian Fit With Standards Chi Squared:2.542
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:31.8 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

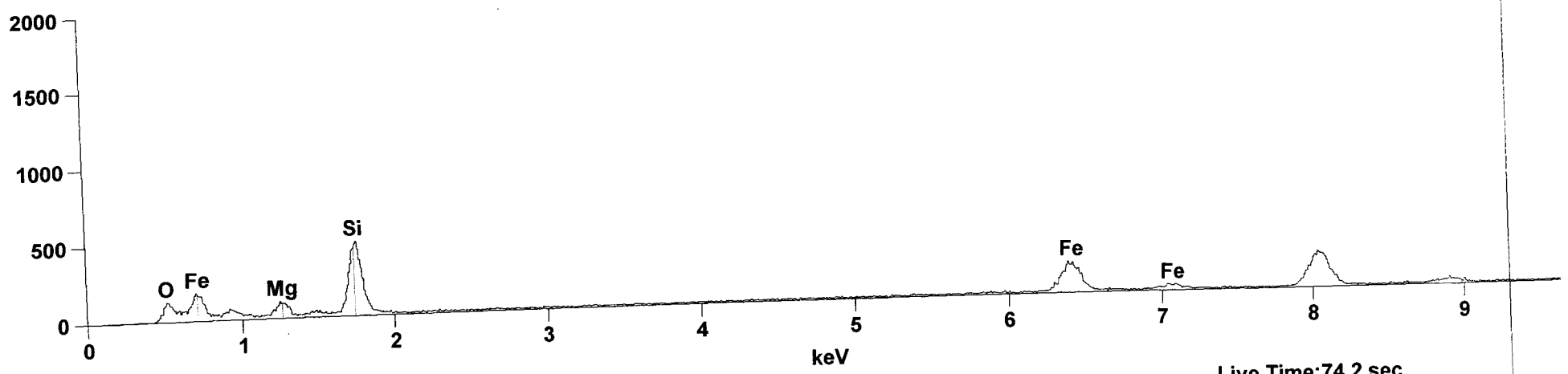
Quantitative Results 141276-SSANS5-05-00001BPC-A-G4-3(1)

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	419	13.52	---	19.24	+/- 0.96
Si K	2063	44.36	---	54.66	+/- 1.22
Fe K	1399	42.12	---	26.10	+/- 0.73
Total		100.00		100.00	

Project: New Project

141276-SSANS5-05-00001BPB-F3-1

Full scale counts: 1838



Wed Nov 03 11:02:31 2010
Gaussian Fit With Standards Chi Squared:4.523
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

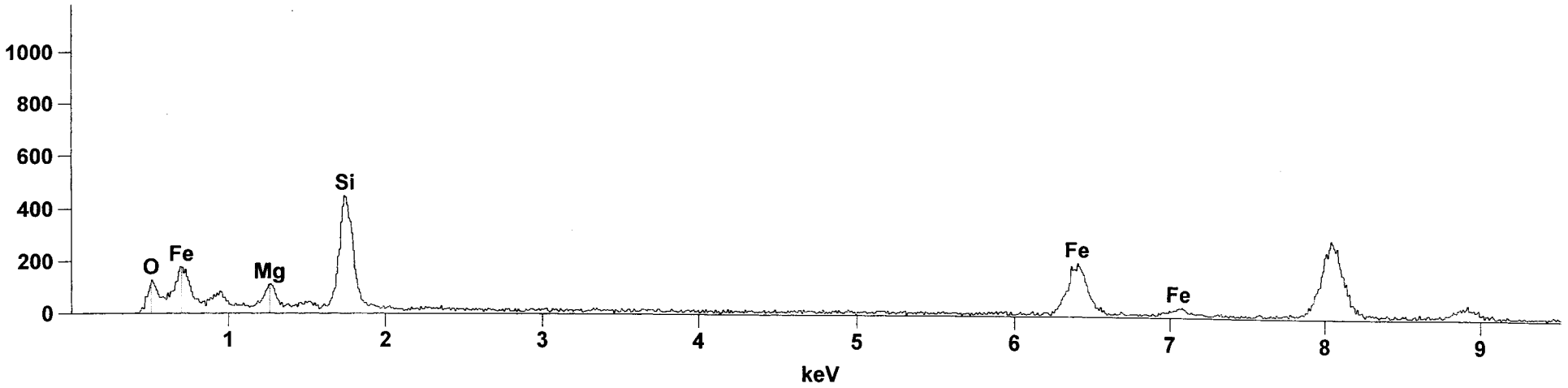
Live Time:74.2 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results 141276-SSANS5-05-00001BPB-F3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1011	14.19	---	19.98	+/- 0.65
Si K	4834	45.22	---	55.13	+/- 0.82
Fe K	3100	40.60	---	24.89	+/- 0.48
Total		100.00		100.00	

Project: New Project

Full scale counts: 1090 **141276-SSANS5-05-00001BPC-C-H3 -1**



Wed Nov 03 11:05:00 2010
Gaussian Fit With Standards Chi Squared:5.453
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:75.2 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

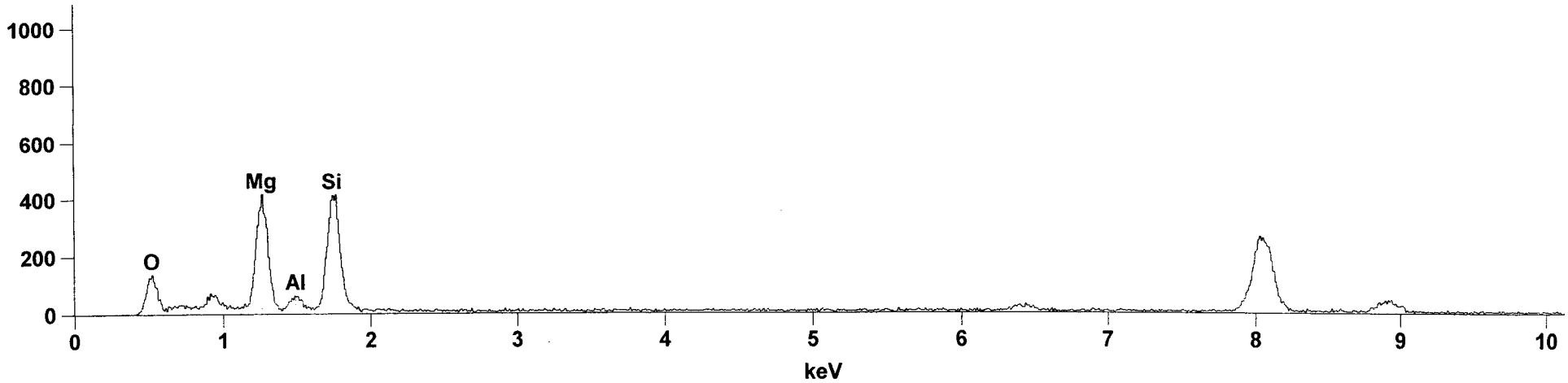
Quantitative Results 141276-SSANS5-05-00001BPC-C-H3 -1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1021	14.68	---	20.77	+/- 0.67
Si K	4574	43.84	---	53.68	+/- 0.83
Fe K	3092	41.49	---	25.55	+/- 0.50
Total		100.00		100.00	

Project: New Project

Full scale counts: 1003

EDS CALISSAN5-05-00001BPC-B-H5-3



Wed Nov 03 07:53:50 2010
Gaussian Fit Chi Squared:3.819
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

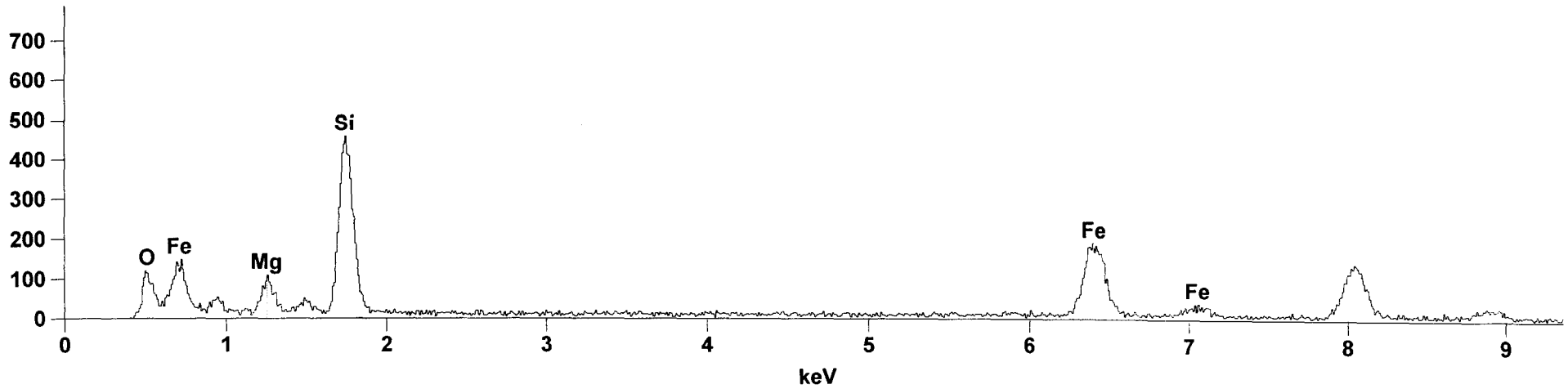
Live Time:66.1 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results EDS CALISSAN5-05-00001BPC-B-H5-3

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	3810	68.35	+/- 1.13	71.24	+/- 1.18
Al K	583	5.51	+/- 0.25	5.17	+/- 0.23
Si K	4210	26.15	+/- 0.42	23.58	+/- 0.38
Total		100.00		100.00	

Project: New Project

Full scale counts: 725 **141276-SSANS5-05-00001BPC-E-E3-1**



Wed Nov 03 11:21:52 2010
Gaussian Fit With Standards Chi Squared:3.410
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:34.9 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

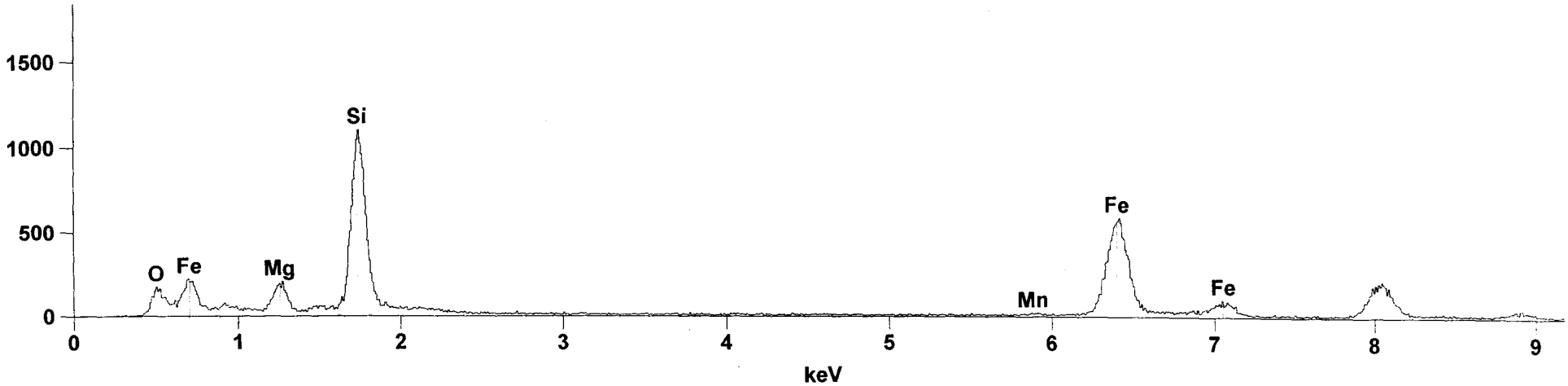
Quantitative Results 141276-SSANS5-05-00001BPC-E-E3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	942	13.27	---	18.94	+/- 0.64
Si K	4709	44.21	---	54.63	+/- 0.84
Fe K	3235	42.52	---	26.42	+/- 0.50
Total		100.00		100.00	

Project: New Project

Full scale counts: 1694

141276-SSANS5-05-00001BPC-E-H3-4



Wed Nov 03 11:28:32 2010
Gaussian Fit With Standards Chi Squared:7.511
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:13.2 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results 141276-SSANS5-05-00001BPC-E-H3-4

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	2081	10.77	---	16.04	+/- 0.36
Si K	11812	40.76	---	52.53	+/- 0.51
Mn K	99	0.44	---	0.29	+/- 0.06
Fe K	9941	48.02	---	31.13	+/- 0.33
Total		100.00		100.00	

ELECTRON DIFFRACTION ANALYSIS

EMS LAB NO. 141276 SAMPLE NO. SSANS-05-0.00_1BPC

CLIENT NORTHGATE ENV. GRID A

DATE ANALYZED 11/5/2010 PHOTO NO. 08080335 28

Camera Constant (CC) 28.2 K-Factor for Mg ____

EDS PEAK AREA RATION

Na ____ Mg ____ Si ____ Ca ____ Fe ____ Other ____

DIFFRACTION DATA - AMPHIBOLES

d_1 9.40 R_1 3

d_2 4.95 R_2 5.7

d_1/d_2 1.9 0 ($<R_1R_2$) 75°

Zone Axis 101

Fiber Identification AMOSITE

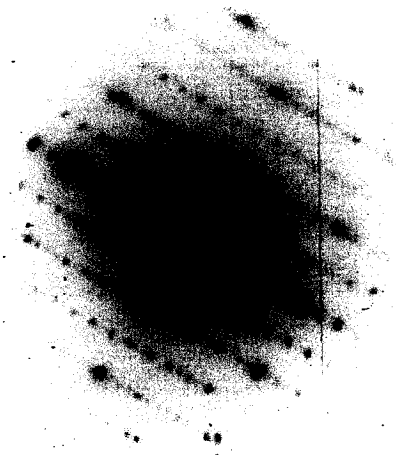
DIFFRACTION DATA - CHRYSOTILE

(002)/ (004) ____/____ R_1 = ____

(020) ____ R_2 = ____

(110) ____ R_3 = ____

Layer Lines ____



02/13/06
ah

TEM CALIBRATION 13A
(1994)

08080335 28

EMS Laboratories Inc.
117 West Bellevue Drive, Pasadena, CA 91105
Phone: 626-568-4065 Fax: 626-796-5282
Email: akolk@emslabs.com

Attn: Derrick Wills
Tronox-LLC-Henderson
PO Box 55
Henderson, NV 89009

Phone: (947) 375-7004

Customer ID: TRNX26
Customer PO: 2027.001
Received: 11/1/2010 9:36 AM
EMS LAB No: 141276
Date Prepared: 11/3/2010 12:30 AM
Analysis Date: 11/4/2010 10:00 AM

Project: Tronox LLX Henderson, 560 W. Lake Mead Dr., Henderson, NV/2027.001

Report Date: November 8, 2010

Date Sampled: 10/28/2010 17:30

NIOSH 7402/ISO

DRAFT, MODIFIED ELUTRIATOR METHOD FOR THE DETERMINATION OF ASBESTOS IN SOILS AND BULK MATERIAL METHOD

EMS Laboratory Number:	141276		Mass of Respirable Dust on Filter:	136	µg
Customer Sample Number:	SSAN4-01-0.00_1_BPC		Area of collection filter:	385	mm^2
Minimum Level of Analysis (chrysotile):	CD		Grid openings area:	0.0094	mm^2
Minimum Level of Analysis (amphibole):	ADX		Grid Openings Analyzed:	120	
Magnification used for fiber counting:	9,200	x	Min. Str. Length/Max Str. Diameter:	>5/<0.4	microns
Aspect ratio for fiber definition:	3:1				
			Analyst(s):	Radha Singh	

Dust Generator - Total Dried Sample Weight-75.3g		Soil % Moisture	4.6	%
	Air Flow Rate Through ME Opening of Dust Generator:		1370	
Not Used	Air Flow Rate Through IST Opening of Dust Generator:		100	
Used in Tumbler	Estimate Total Air Flow Through Elutriator:		1470	

Analytical Sensitivity: 2.51E+06 Structure /g PM 10 Limit of Detection: 7.52E+06 Structure /g PM 10

Test For Uniformity (Chi-Square results)

		Counts		Poisson 95% Confidence Interval			
Structure Class	**Min ID Level Required**	**Primary Str.**	**Total Str.**	**Density** St/mm^2	**Conc.** Str/g PM10	**Lower Limit** Str/g PM10	**Upper Limit** Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	0	0	0	0	0	7.52E+06
Asbestos Structures>5um, ≤10um (Chrys)	CD	0	0	0	0	0	7.52E+06
Asbestos Structures>5um, ≤10um (Amph)	ADX	0	0	0	0	0	7.52E+06
Asbestos Structure >10um (Long)	ADX/CD	2	2	5.02	6.08E+05	0	1.81E+07
Asbestos Structure >10um (Chrys)	CD	2	2	5.02	6.08E+05	0	1.81E+07
Asbestos Structure >10um (Amph)	ADX	0	0	0	0	0	7.52E+06
Total Protocol Asbestos Structures	ADX/CD	2	2	5.02	6.08E+05	0	1.81E+07
Protocol Asbestos Structures (Chrys)	CD	2	2	5.02	6.08E+05	0	1.81E+07
Protocol Asbestos Structures (Amph)	ADX	0	0	0	0	0	7.52E+06
Total Protocol Non Asbestos Structures	NAM	3	3	2.66	7.53E+06	1.55E+06	2.20E+07

Approved by Technical Director

EMS Laboratories

NIOSH 7402/ISO
117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm²
Report number :	141276	**Magnification:**	9200
Sample number:	SSAN4-01-0.00_1_BPC	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 11/3/2010 by Joel Paruli
Preparation Date: 11/4/2010 by Joel Paruli
Analysis Date: 11/4/2010 by Radha Singh

Asbestos Structures>5um, ≤10um (Chrys)	0
Asbestos Structures>5um, ≤10um (Amph)	0
Asbestos Structure >10um (Chrys)	2
Asbestos Structure >10um (Amph)	0
Protocol Asbestos Structures (Chrys)	2
Protocol Asbestos Structures (Amph)	0

Grid Openings	120
Mass - ug	136
Anlytical sensitivity	

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions - mm		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Width	Length	Width	Length				
1A	C31	None Detected										
1A	C34	None Detected										
1A	E31	None Detected										
1A	E34	None Detected										
1A	F31	None Detected										
1A	F34	None Detected										
1A	G31	None Detected										
1A	C33	None Detected										
1A	C36	None Detected										
1A	E33	None Detected										
1A	E36	None Detected										
1A	C41	None Detected										
1A	C44	None Detected										
1A	E41	None Detected										
1A	E44	None Detected										
1A	F41	None Detected										
1A	F44	None Detected										
1A	G41	None Detected										
1A	H43	None Detected										
1A	H46	None Detected										
1A	E51	None Detected										
1A	E54	None Detected										
1A	G51	None Detected										
1B	E23	None Detected										
1B	E26	None Detected										
1B	F23	F			1	52	0.11	5.65				Non Asbestos
1B	G23	None Detected										
1B	G26	None Detected										
1B	C31	F			0.5	49	0.05	5.33				Non Asbestos
1B	C34	None Detected										
1B	E31	None Detected										
1B	E34	None Detected										
1B	F31	MD11	1		130	380	14.13	41.30				
		MB		1	2.5	300	0.27	32.61	CD	Chrysotile		
1B	F34	None Detected										
1B	G31	None Detected										
1B	G34	B			8	60	0.87	6.52				Non Asbestos
1B	H31	F	2	2	1	105	0.11	11.41	CD	Chrysotile		
1B	H34	F			4	50	0.43	5.43				Non Asbestos
1B	C33	None Detected										
1B	C36	None Detected										
1B	E33	None Detected										

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number				Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total			Width	Length				
1B	E41	None Detected										
1B	E44	None Detected										
1B	F41	MD11			35	110	3.80	11.96				
		MF			8.5	80	0.92	8.70				Non Asbestos
1B	F44	None Detected										
1B	G41	None Detected										
1C	C26	None Detected										
1C	E23	None Detected										
1C	E26	F			1	55	0.11	5.98				Non Asbestos
1C	F23	None Detected										
1C	C31	None Detected										
1C	C34	None Detected										
1C	E31	None Detected										
1C	E34	None Detected										
1C	F31	None Detected										
1C	F34	None Detected										
1C	C41	MD11			52	55	5.65	5.98				
		MF			6.5	52	0.71	5.65				Non Asbestos
1C	C44	None Detected										
1C	E41	None Detected										
1C	E44	None Detected										
1C	C51	None Detected										
1C	C54	None Detected										
1C	E51	None Detected										
1C	E54	None Detected										
1C	F51	MD11			50	105	5.43	11.41				
		MF			8	72	0.87	7.83				Non Asbestos
1C	G51											
1C	G54	None Detected										
1C	H53	None Detected										
1C	H56	None Detected										
1D	C26	None Detected										
1D	E23	None Detected										
1D	E26	None Detected										
1D	F23	None Detected										
1D	F26	None Detected										
1D	C31	None Detected										
1D	C34	None Detected										
1D	E31	None Detected										
1D	E34	None Detected										
1D	F31	F			12	65	1.30	7.07				Non Asbestos
1D	F34	None Detected										
1D	G31	None Detected										
1D	G34	None Detected										
1D	H31	None Detected										
1D	E41	None Detected										
1D	E46	None Detected										
1D	F41	None Detected										
1D	F46	None Detected										
1D	G41	None Detected										
1D	G44	None Detected										
1D	C51	None Detected										
1D	C54	None Detected										
1D	E53	None Detected										
1E	E23	None Detected										
1E	E26	None Detected										
1E	F23	None Detected										

EMS Laboratories

NIOSH 7402/ISO
117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	[redacted]
Sample number:	

Analyzed by:	[redacted]
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number				Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total			Width	Length				
1E	F26	None Detected										
1E	G23	None Detected										
1E	G26	None Detected										
1E	C31	None Detected										
1E	C34	None Detected										
1E	E31	None Detected										
1E	E34	None Detected										
1E	F31	None Detected										
1E	F34	None Detected										
1E	G31	None Detected										
1E	G34	None Detected										
1E	H33	None Detected										
1E	H36	None Detected										
1E	E41	None Detected										
1E	E44	None Detected										
1E	F41	None Detected										
1E	F44	None Detected										
1E	B54	None Detected										
1E	C51	None Detected										
1E	C54	None Detected										
1E	E51	None Detected										
1E	F53	None Detected										
1E	F56	None Detected										
1E	G53	None Detected										
1E	G56	None Detected										

Elutriator Data

Date: 11/3/10 Client: NORTHGATE

Lab #: 141276

Sample ID: SSAN4-01-0.00-01BPC Sample weight (g): 75.3

Time air flow started: 900 Tumbler rpm: 30

IST Flowmeter (mL/min): 100 ME Flowmeter (mL/min): 1370

Filter No.	Start Time	Tested flow rate (mL/min)	Final Filter Wt (mg)	Initial Filter Wt (mg)	Dust Weight (mg)	Time Value (min)	Avg. rate of deposition (ug/min)	Optimal time (min)	
1	1100	185	0.03465	0.02489	9.76	30			OK
2	1130		0.03200	0.02464	7.36	20			OK
3	1150		0.03519	0.02475	10.44	30			5% loss
4	1220		0.03502	0.02493	10.09	30			OK
5	1250		0.03436	0.02480	9.56	30			10% loss
6	1320			0.02476					
7									
8									

	S.Time	End Time						Dep. Rate	Estiimate	
1	1140	1148		4.774	4.704	0.070	8			
2	1158	1214		4.780	4.651	0.129	18			
3	1230	1245		4.861	4.725	0.136	15			* 45 RPM
4	1257	1317		5.142	4.768	0.374	20			
5										
6										
7										
8										
9										
10										

* RAISE RPM TO 45 @ 1224

141276 3 soils for moisture content

11-2-10

#SSAN5-05-0.00-01-BPC

dish wt.	19.24 g	
dish + S	119.26	(initial wt. 100.02 g)
6:45 - 7:45	111.20	(91.96 g)
9:00 - 10:00	111.16	(Final wt. 91.92 g)

$$\%\ \text{moisture} = 100 \times \frac{100.02 - 91.92}{91.92} = 8.8\ \%$$

#SSAN4-01-0.00_01_BPC

dish wt.	31.47 g	
dish + S	131.54	(initial wt. 100.07 g)
6:45 - 7:45	127.12	(95.65 g)
9:00 - 10:00	127.10	(Final wt. - 95.63)

$$\%\ \text{moisture} = 100 \times \frac{100.07 - 95.63}{95.63} = 4.64\ \%$$

#SSAP8-02-0.00_01_BPC

dish wt.	31.44	
dish + S	131.71	(Initial wt. = 100.27 g)
6:45 - 7:45	123.02	(91.58 g)
9:00 - 10:00	122.61	(91.17 g)
[illegible]	122.59	(Final wt. 91.15 g)

$$\text{Moisture} = 100 \times \frac{100.27 - 91.15}{91.15} = 10.0\ \%$$

BP

105

Copy

Count (Page of) NIOSH 7402/ISO

Prep Time: 730 1000 AM

Report number: 141276
Sample number: SSAN4-01-0.00-01BPC
File name: Northgate
Sample Description: 136 mg

Filter Type: PC 385 mm2
Date Sample was Run: 11/3/10

Magnification: 9,200 X

Preparation date: 11/4/10 By JAP
Analysis date: 11-4-10 By RR
(A): ADX, ADQ

Grid opening dimension: 0.0094 mm²
Level of Analysis: (C): CD, CDX

Grid loading Moderate Condition of Grid good

Grid	Grid Opening	Number of structures Primary	Number of structures Total	Class	Type of Structure	Width mm	Length mm	Comments
1A	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	G3-1							
	G3-3							
	G3-6							
	F3-3							
	F3-6							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-1							
	F4-4							
	G4-1							
	G4-3							
	G4-6							
	F5-1							
	F5-4							
	G5-1							
1B	E2-3							
	E2-6							
	F2-3				R	1	52	Network (MN)
	G2-3							
	G2-6							
	C3-1				R	0.5	49	Non asb (MN)

EM-10A (2002)

TEM Asbestos Structure Count (Page of)

Report number: 141276 SAMPLE NO: SSAN4-01-0.00-01 BPC x 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
B	C3-4							
	E3-1							
	E3-4							
	F3-1				INDII	130	380	EDS Chryso.
					MB	2 U	300	
	F3-4							
	G3-1							
	G3-4				B	F	60	Nanash,
	B-1				E	1	105	Chryso.
	B-4				I-	4	50	Nandrb. (MM)
	C3-3							
	C3-6							
	E3-3							
	E4-1							
	E4-4							
	F4-1				MDII	3.5-	10	Nanash.
	E4-4				MI-	8.1-	80	
	G4-1							
C	C2-6							
	E2-3							
	E2-6				I-	1	55	Nanash.
	F2-3							
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	C4-1				MDII	2	51-	Nanash.
	C4-4				MII-	6.1-	52	N
	E4-1							
	E4-4							
	C5-1							
	C5-4							
	E5-1							

TEM Asbestos Structure Count (Page of)

Report number: 141276 SAMPLE NO: SSAN4-01_0.00_01 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
	E5-4							
	E5-1				MD11	50	105	Nanarb
	G5-1				MF	8	72	
	G5-4							
	H5-3							
	H5-6							
1D	C2-6							
	E2-3							
	E2-6							
	F2-3							
	F2-6							
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1				F	12	65	Nanarb
	F3-4							
	G3-1							
	G3-4							
	H3-1							
	E4-1							
	E4-4							
	F4-1							
	F4-4							
	G4-1							
	G4-4							
	C5-1							
-	C5-4							
	E5-3							
1E	E2-3							
	E2-6							
	F2-3							

TEM Asbestos Structure Count (Page of)

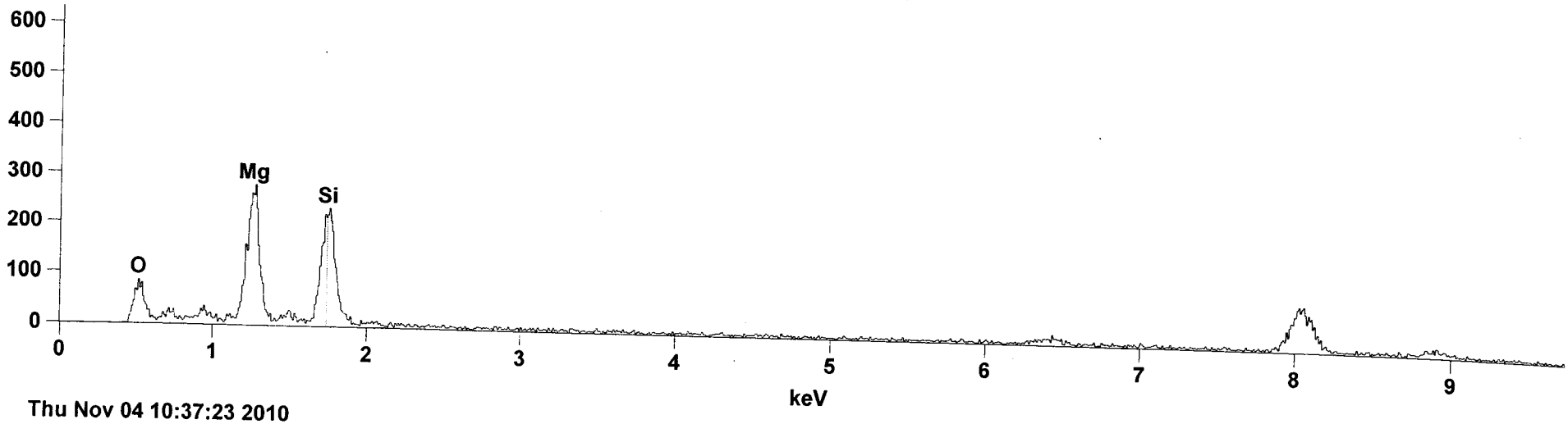
Report number: 141276 SAMPLE NO: SSAN4-01_0.00-01 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
	F2-6							
	H2-3							
	H2-6							
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	H3-1							
	H3-4							
	I-3-3							
	I-3-6							
	E4-1							
	E4-6							
	F4-1							
	F4-4							
	B5-4							
	C5-1							
	C5-4							
	E5-1							
	E5-3							
	E5-6							
	H5-3							
	H5-6							

Project: New Project

Full scale counts: 580

141276-SSAN4-01-000-01 BPC-B(F3-1



Thu Nov 04 10:37:23 2010
Gaussian Fit With Standards Chi Squared:3.914
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:31.3 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results 141276-SSAN4-01-000-01 BPC-B(F3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	2546	61.10	---	64.48	+/- 1.29
Si K	2431	38.90	---	35.52	+/- 0.73
Total		100.00		100.00	

EMS Laboratories Inc.
117 West Bellevue Drive, Pasadena, CA 91105
Phone: 626-568-4065 Fax: 626-796-5282
Email: akolk@emslabs.com

Attn: Derrick Wills
Tronox-LLC-Henderson
PO Box 55
Henderson, NV 89009

Phone: (947) 375-7004

Project: Tronox LLX Henderson, 560 W. Lake Mead Dr., Henderson, NV/2027.001

Date Sampled: 10/28/2010 16:38

Customer ID: TRNX26
Customer PO: 2027.001
Received: 11/1/2010 9:36 AM
EMS LAB No: 141276
Date Prepared: 11/4/2010 11:53 AM
Analysis Date: 11/5/2010 10:00 AM

Report Date: November 8, 2010

NIOSH 7402/ISO

DRAFT, MODIFIED ELUTRIATOR METHOD FOR THE DETERMINATION OF ASBESTOS IN SOILS AND BULK MATERIAL METHOD

EMS Laboratory Number:	141276		Mass of Respirable Dust on Filter:	144	µg
Customer Sample Number:	SSAP8-02-0.00_01_BPC		Area of collection filter:	385	mm^2
Minimum Level of Analysis (chrysotile):	CD		Grid openings area:	0.0094	mm^2
Minimum Level of Analysis (amphibole):	ADX		Grid Openings Analyzed:	107	
Magnification used for fiber counting:	9,200	x	Min. Str. Length/Max Str. Diameter:	>5/<0.4	microns
Aspect ratio for fiber definition:	3:1				
			Analyst(s):	Radha Singh	

Dust Generator - Total Dried Sample Weight-74.8g	Soil % Moisture	10	%
	Air Flow Rate Through ME Opening of Dust Generator:	1370	
Not Used	Air Flow Rate Through IST Opening of Dust Generator:	100	
Used in Tumbler	Estimate Total Air Flow Through Elutriator:	1470	

Analytical Sensitivity:	2.66E+06 Structure /g PM 10	Limit of Detection:	7.96E+06 Structure /g PM 10

Test For Uniformity (Chi-Square results)

		Counts		Poisson 95% Confidence Interval			
Structure Class	**Min ID Level Required**	**Primary Str.**	**Total Str.**	**Density** St/mm^2	**Conc.** Str/g PM10	**Lower Limit** Str/g PM10	**Upper Limit** Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	0	0	0	0	0	7.96E+06
Asbestos Structures>5um, ≤10um (Chrys)	CD	0	0	0	0	0	7.96E+06
Asbestos Structures>5um, ≤10um (Amph)	ADX	0	0	0	0	0	7.96E+06
Asbestos Structure >10um (Long)	ADX/CD	0	0	0	0	0	7.96E+06
Asbestos Structure >10um (Chrys)	CD	0	0	0	0	0	7.96E+06
Asbestos Structure >10um (Amph)	ADX	0	0	0	0	0	7.96E+06
Total Protocol Asbestos Structures	ADX/CD	0	0	0	0	0	7.96E+06
Protocol Asbestos Structures (Chrys)	CD	0	0	0	0	0	7.96E+06
Protocol Asbestos Structures (Amph)	ADX	0	0	0	0	0	7.96E+06
Total Protocol Non Asbestos Structures	**NAM**	15	15	14.9	3.99E+07	2.23E+07	6.58E+07

Approved by Technical Director

EMS Laboratories

NIOSH 7402/ISO
117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm²
Report number :	141276	**Magnification:**	9200
Sample number:	SSAP8-02-0.00_01_BPC	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 11/4/2010 by Joel Paruli
Preparation Date: 11/5/2010 by Joel Paruli
Analysis Date: 11/5/2010 by Radha Singh

Asbestos Structures>5um, ≤10um (Chrys)	0	**Grid Openings**	107
Asbestos Structures>5um, ≤10um (Amph)	0	**Mass - ug**	144
Asbestos Structure >10um (Chrys)	0	**Anlytical sensitivity**	
Asbestos Structure >10um (Amph)	0		
Protocol Asbestos Structures (Chrys)	0		
Protocol Asbestos Structures (Amph)	0		

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions - mm		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Width	Length	Width	Length				
1A	C31	None Detected										
	E31	None Detected										
	E34	None Detected										
	F31	None Detected										
	F34	F			2.5	60	0.27	6.52				Non Asbestos
	G31	None Detected										
	G34	None Detected										
	H31	None Detected										
	C33	None Detected										
	C36	None Detected										
	E33	None Detected										
	E36	None Detected										
	F33	None Detected										
	F36	None Detected										
	C41	F			10	110	1.09	11.96				Non Asbestos
	C44	None Detected										
	E43	None Detected										
	E46	None Detected										
	F51	B			10	35	1.09	3.80				Non Asbestos
	F54	MD11			35	98	3.80	10.65				
		MF			1.5	98	0.16	10.65				Non Asbestos
1B	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	C31	None Detected										
	C34	F			2.5	105	0.27	11.41				Non Asbestos
	E31	F			4.5	75	0.49	8.15				Non Asbestos
	E34	F			10	110	1.09	11.96				Non Asbestos
		MD11			65	150	7.07	16.30				Non Asbestos
		MF			6.5	150	0.71	16.30				Non Asbestos
	F31	F			1.5	60	0.16	6.52				Non Asbestos
	F34	None Detected										
	G31	None Detected										
	G34	None Detected										
	H31	F			1.5	100	0.16	10.87				Non Asbestos
	E33	None Detected										
	E36	None Detected										
	F33	None Detected										
	E41	None Detected										
	E44	F			2	55	0.22	5.98				Non Asbestos
	F43	F			2.5	78	0.27	8.48				Non Asbestos
	F46	None Detected										
	G51	None Detected										
	G54	None Detected										
	H51	F			0.5	85	0.05	9.24				Non Asbestos
1C	C26	None Detected										
	E23	F			2.5	80	0.27	8.70				Non Asbestos
	E26	None Detected										

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total			Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
	F23	None Detected										
	F26	MD11			80	110	8.70	11.96				Non Asbestos
		MF			3.5	75	0.38	8.15				Non Asbestos
	G23	None Detected										
	G26	None Detected										
	C31	F			1.5	65	0.16	7.07				Non Asbestos
	C34	None Detected										
	E31	None Detected										
	E34	None Detected										
	F31	None Detected										
	G31	None Detected										
	G34	F			12.5	70	1.36	7.61				Non Asbestos
	H31	None Detected										
	C41	None Detected										
	C44	MD21			80	90	8.70	9.78				Non Asbestos
		MF			1.5	50	0.16	5.43				Non Asbestos
	E41	None Detected										
	E44	None Detected										
	F41	None Detected										
	F44	None Detected										
	G41	None Detected										
1D	C23	None Detected										
	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	F23	None Detected										
	F26	None Detected										
	F31	F			0.5	70	0.05	7.61				Non Asbestos
	F34	None Detected										
	G31	None Detected										
	G34	None Detected										
	C41	None Detected										
	C44	None Detected										
	E41	None Detected										
	E44	None Detected										
	F41	None Detected										
	F44	MD11			100	145	10.87	15.76				Non Asbestos
		MF			3.5	145	0.38	15.76				Non Asbestos
	G41	None Detected										
	G44	None Detected										
	H41	None Detected										
	H44	None Detected										
	F51	None Detected										
	F54	MD11			35	160	3.80	17.39				Non Asbestos
		MF			1.5	160	0.16	17.39				Non Asbestos
1E	C23	None Detected										
	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	F23	None Detected										
	F26	None Detected										
	E31	None Detected										
	E36	None Detected										
	F31	None Detected										
	F36	None Detected										
	E36	None Detected										
	F31	None Detected										
	F36	None Detected										
	G31	None Detected										
	G34	None Detected										
	H31	None Detected										
	G41	None Detected										
	G44	None Detected										
	H43	None Detected										
	H46	None Detected										
	K33	None Detected										

Elutriator Data

Date: 11/4/10 Client: NORTHGATE

Lab #: 141276

Sample ID: SSAP8-02-0.00-01BPC Sample weight (g): 74.8

Time air flow started: 800 Tumbler rpm: 30

IST Flowmeter (mL/min): 100 ME Flowmeter (mL/min): 1370

Filter No.	Start Time	Tested flow rate (mL/min)	Final Filter Wt (mg)	Initial Filter Wt (mg)	Dust Weight (mg)	Time Value (min)	Avg. rate of deposition (ug/min)	Optimal time (min)	
1	1000	185	0.03365	0.02465	9.00	30			50% loss
2	1030		0.03594	0.02463	11.31	20			ok
3	1050		0.03228	0.02502	7.26	20			ok
4	1110		0.03027	0.02447	5.80	15			20% loss
5	1125		0.03201	0.02460	7.41	20			ok
6	1145		0.03229	0.02484	7.45	35			25% loss
7	1220								
8									

	Start Time	End Time						Dep. Rate	Estiimate
				.9771 BK 11/4/09					
1	1040	1045		4.665	4.665	0.106	5		
2	1056	1105		4.969	4.763	0.206	9		
3	1115	1243		4.829	4.704	0.125	8		
4	1130	1144		4.811	4.694	0.117	14		
5	1153	1217		4.848	4.704	0.144	24		
6									
7									
8									
9									
10									

* RAISE RPM TO ____ @ ____

11-2-10

#SSAN5-05-0.00-01-BPC

dish wt.	19.24 g	
dish + S	119.26	(Initial wt. 100.02 g)
6:45 - 7:45	111.20	(91.96 g)
9:00 - 10:00	111.16	(Final wt. 91.92 g)

$$\%\ \text{moisture} = 100 \times \frac{100.02 - 91.92}{91.92} = 8.8\ \%$$

#SSAN4-01-0.00_01_BPC

dish wt.	31.47 g	
dish + S	131.54	(Initial wt. 100.07 g)
6:45 - 7:45	127.12	(95.65 g)
9:00 - 10:00	127.10	(Final wt. - 95.63)

$$\%\ \text{moisture} = 100 \times \frac{100.07 - 95.63}{95.63} = 4.64\ \%$$

#SSAP8-02-0.00_01_BPC

dish wt.	31.44	
dish + S	131.71	(Initial wt. = 100.27 g)
6:45 - 7:45	123.02	(91.58 g)
9:00 - 10:00	122.61	(91.17 g)
[illegible]	122.59	(Final wt. 91.15 g)

$$\%\ \text{Moisture} = 100 \times \frac{100.27 - 91.15}{91.15} = 10.0\ \%$$

BP

copy 95

Count (Page of) NIOSH 7402/ISO

Prep Time: 7^00 - 9^30

Report number: 141276
Sample number: SSAPS-02-0.00-01 Bpc
File name: Northgate
Sample Description: 144 : mg

Filter Type: PC 385 mm2
Date Sample was Run: 11/4/10

Magnification: 9,200 X

Preparation date: 11/5/10 By JAP
Analysis date: 11-5-10 By RF
(A): ADX, ADQ

Grid opening dimension: 0.0094 mm^2
Level of Analysis: (C): CD, CDX

Grid loading Moderate
Condition of Grid good

Grid	Grid Opening	Number of structures Primary	Number of structures Total	Class	Type of Structure	Width mm	Length mm	Comments
A	C3-1							
	E3-1							
	E3-4							
	F3-1							
	F3-4				F	<5	60	Non asb
	G3-1							
	G3-4							
	H3-1					5		
	C3-3							
	C3-6							
	E3-3							
	E3-6							
	F3-3							
	F3-3							
	C4-1				F	10	110	Non asb
	C4-4							
	E4-3							
	E4-6							
	F4-1				13	10	55	Non asb
	F4-4				MD11	35	98	Non asb
					MF	15	98	
1B	C2-6							
	E2-3							
	E2-6							
	C3-1							
	C3-4				F	2.5	105	Non asb
	E3-1				F	4.5	75	Non asb
	E3-4				F	10	110	Non asb
					MD11	65	150	Non asb
					MF	6.5	150	

EM-10A (2002)

cat

TEM Asbestos Structure Count (Page of)

Report number: 141276 SAMPLE NO: SSAP8-02-0.00-01 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1B	F3-1				E	1.5-	60	Nanash. EDS
	F3-4							
	G3-1							
	G3-4							
	H3-1				E	1.5-	140	Nanash. EDS
	E3-3							
	E3-6							
	F3-3							
	E4-1							
	E4-4				E	2	[illegible]	Nanash
	E4-3				E	2.5-	78	Nanash.
	E4-6							
	G5-1							
	G5-4							
	H5-1				E	0.5-	85-	Nanash, EDS
1C	C2-6				E			
	F2-3				E	2.5-	80	Nanash EDS
	E2-6							
	E2-3							
	F2-6				MD11	80	110	Nanash
					MI	35-	75-	EDS
	G2-3							
	G2-6							
	C3-1				E	1.5-	65-	Nanash EDS
	C3-4							
	E3-1							
	E3-4							
	E3-1							
	G3-1							
	G3-4				E	12.5-	70	Nanash
	H3-1							
	C4-1							
	C4-4				MD21	80	90	Nanash.
					MI	1.5-	50	
	E4-1							

TEM Asbestos Structure Count (Page of)

Report number: 141276 SAMPLE NO: SSAPB-02-0.00-01 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
C	E4-4							
	E4-1							
	F4-4							
	G4-1							
1D	C2-3							
	C2-6							
	E2-3							
	E2-6							
	F2-3							
	F2-6							
	F3-1				F	0.5	70	Nanosh
	F3-4							
	G3-1							
	G3-4							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-1							
	F4-4				MDII	10	14	Nanosh
					MI	3	14	
	G4-1							
	G4-4							
	H4-1							
	H4-4							
	F5-1							
	F5-4				MDII	3	160	Nanosh double
					MI	1	160	
1E	C2-3							
	C2-6							
	E2-3							
	E2-6							
	F2-3							

TEM Asbestos Structure Count (Page of)

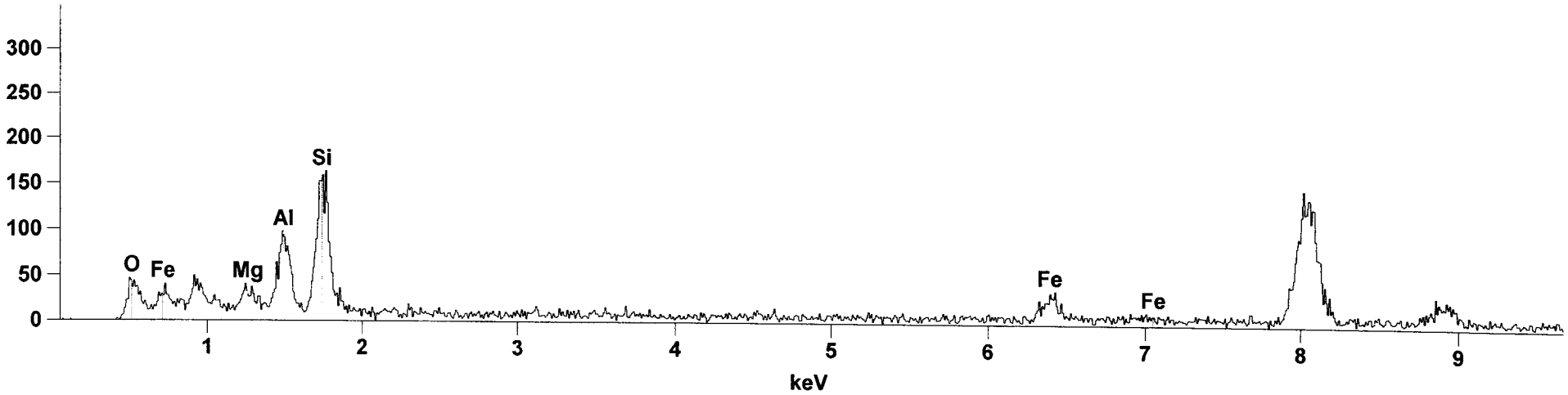
Report number: 141276 SAMPLE NO: SSAP8-02-0.00-01 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
	F2-6							
	F3-1							
	F3-4							
	F3-1							
	F3-4							
	G3-1							
	G3-4							
	H3-1							
	F4-1							
	F4-4							
	G4-1							
	G4-4							
	H4-3							
	H4-6							
	K3-3							

Project: New Project

Full scale counts: 321

1412276-SSAP8-02-000-01-BPC-B-F3-1



Fri Nov 05 13:44:22 2010
Gaussian Fit Chi Squared:3.127
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:54.9 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

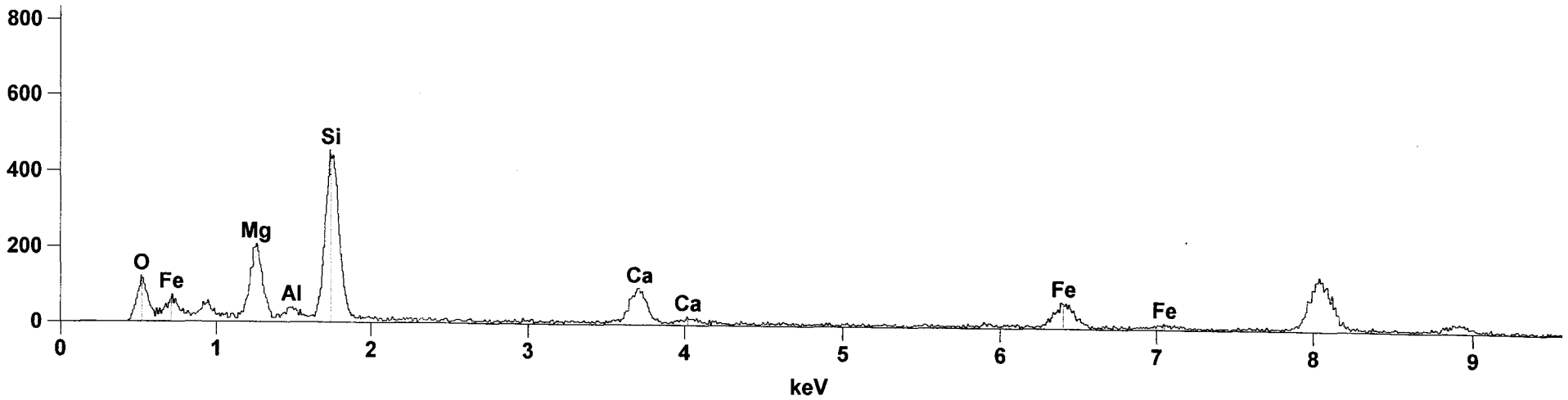
Quantitative Results 1412276-SSAP8-02-000-01-BPC-B-F3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	350	24.47	+/- 1.33	27.55	+/- 1.50
Al K	905	33.32	+/- 1.14	33.79	+/- 1.16
Si K	1534	37.13	+/- 0.99	36.17	+/- 0.97
Fe K	335	5.07	+/- 0.35	2.49	+/- 0.17
Total		100.00		100.00	

Project: New Project

Full scale counts: 767

1412276-SSAP8-02-000-01-BPC-B-H3-1



Fri Nov 05 13:47:29 2010
Gaussian Fit Chi Squared:2.268
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:53.7 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

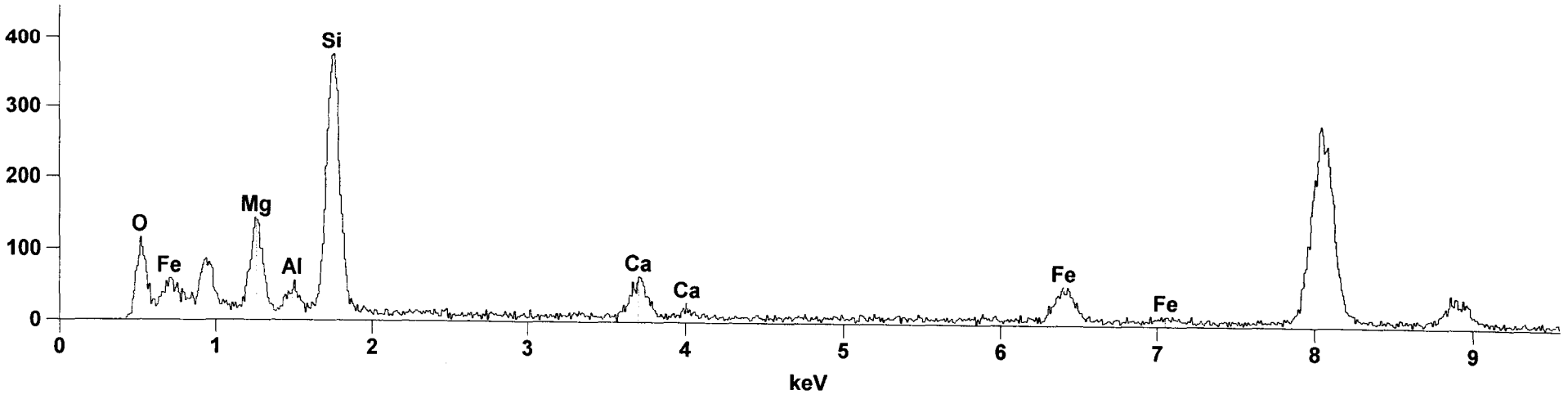
Quantitative Results 1412276-SSAP8-02-000-01-BPC-B-H3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1858	46.14	+/- 1.09	51.64	+/- 1.22
Al K	316	4.13	+/- 0.26	4.17	+/- 0.26
Si K	4586	39.43	+/- 0.61	38.18	+/- 0.59
Ca K	1156	5.20	+/- 0.17	3.53	+/- 0.12
Fe K	948	5.10	+/- 0.18	2.48	+/- 0.09
Total		100.00		100.00	

Project: New Project

Full scale counts: 410

1412276-SSAP8-02-000-01-BPC-B-H5-1



Fri Nov 05 13:50:25 2010
Gaussian Fit Chi Squared:2.159
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:90.0 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

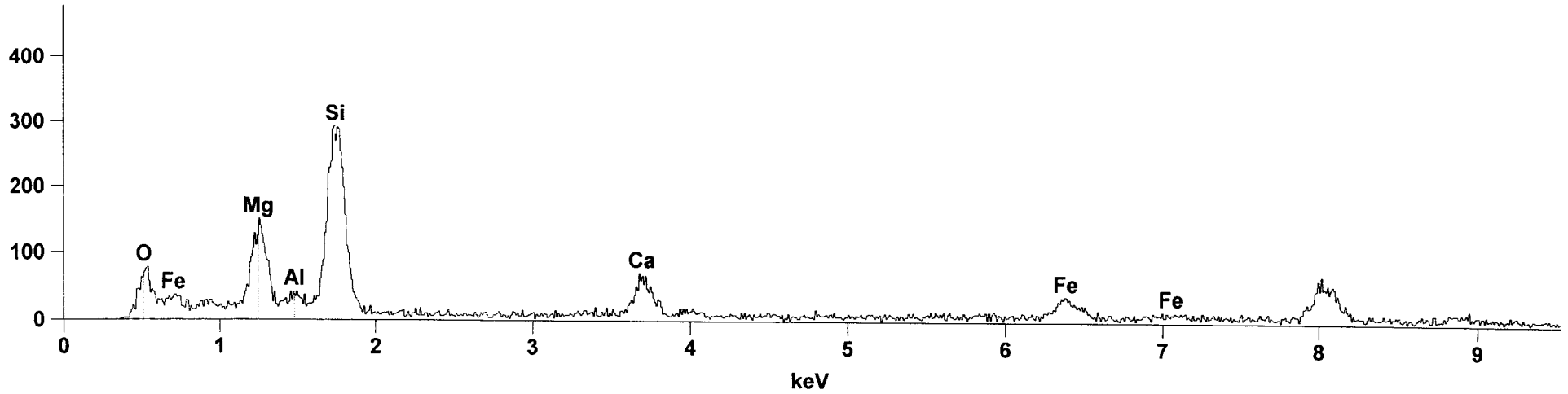
Quantitative Results 1412276-SSAP8-02-000-01-BPC-B-H5-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1083	42.90	+/- 1.35	47.95	+/- 1.51
Al K	336	7.01	+/- 0.42	7.06	+/- 0.42
Si K	3017	41.37	+/- 0.78	40.02	+/- 0.76
Ca K	538	3.86	+/- 0.19	2.62	+/- 0.13
Fe K	567	4.86	+/- 0.24	2.37	+/- 0.12
Total		100.00		100.00	

Project: New Project

Full scale counts: 438

1412276-SSAP8-02-000-01-BPC-C-E2 -3



Fri Nov 05 13:57:30 2010
Gaussian Fit Chi Squared:2.181
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:35.5 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

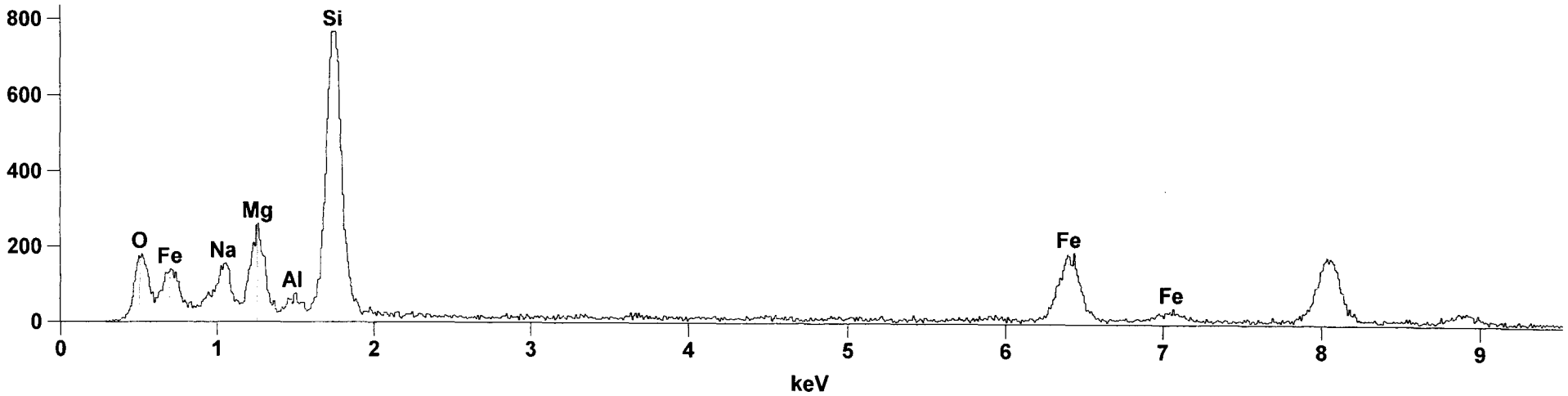
Quantitative Results 1412276-SSAP8-02-000-01-BPC-C-E2 -3

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1821	49.45	+/- 1.19	54.22	+/- 1.31
Al K	489	6.99	+/- 0.34	6.91	+/- 0.34
Si K	3914	36.79	+/- 0.61	34.91	+/- 0.58
Ca K	791	3.89	+/- 0.17	2.59	+/- 0.11
Fe K	489	2.88	+/- 0.16	1.37	+/- 0.08
Total		100.00		100.00	

Project: New Project

Full scale counts: 768

1412276-SSAP8-02-000-01-BPC-C-F2-6



Fri Nov 05 14:01:19 2010
Gaussian Fit Chi Squared:4.539
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:41.2 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

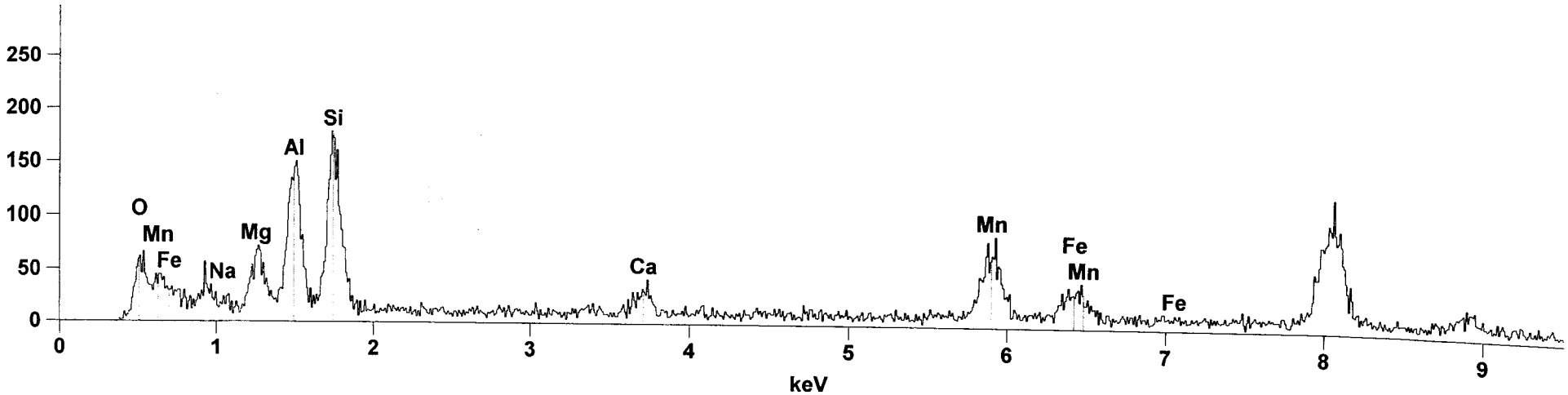
Quantitative Results 1412276-SSAP8-02-000-01-BPC-C-F2-6

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Na K	1527	45.19	+/- 1.18	49.79	+/- 1.30
Mg K	2311	21.80	+/- 0.47	22.72	+/- 0.49
Al K	551	2.74	+/- 0.13	2.57	+/- 0.13
Si K	7647	24.97	+/- 0.30	22.52	+/- 0.27
Fe K	2596	5.30	+/- 0.11	2.41	+/- 0.05
Total		100.00		100.00	

Project: New Project

Full scale counts: 225

1412276-SSAP8-02-000-01-BPC-C-C3-1



Fri Nov 05 14:03:54 2010
Gaussian Fit Chi Squared:2.363
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:32.1 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results 1412276-SSAP8-02-000-01-BPC-C-C3-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Na K	239	23.14	+/- 1.55	26.96	+/- 1.80
Mg K	718	22.15	+/- 0.86	24.41	+/- 0.95
Al K	1586	25.76	+/- 0.68	25.58	+/- 0.68
Si K	1749	18.68	+/- 0.47	17.82	+/- 0.45
Ca K	242	1.35	+/- 0.13	0.90	+/- 0.09
Mn K	1004	6.60	+/- 0.25	3.22	+/- 0.12
Fe K	347	2.32	+/- 0.19	1.11	+/- 0.09
Total		100.00		100.00	

TEM ASBESTOS ANALYSIS

Client: Sand blank
Sample No. 8/25/10

EMS Lab No. ______
Page ______ of ______

copy

RECEIVING

TYPE OF SAMPLE
Air ☐ Water ☐
Soil ☐ Bulk ☐
Other ______

METHOD OF ANALYSIS
EPA 600/4-83-043 ☒ ISO ☐

LEVEL OF ANALYSIS
Chrysotile: CD-CDQ
Amphibole: ADX ADX

ASPECT RATIO
3:1 ☐ 5:1 ☐

EPA/600/R-94/134 100.1 ☐ 100.2 ☐

LENGTHS
All Sizes (EPA) ☐
(μm) ≥0.5 ☐
≥1.0 ☐
≥5.0 ☐
≥10.0 ☐
PCM Range* ☐
*(≥0.25 μm width ≥5.0 μm length)

FILTER TYPE / AREA (mm±)
MCE ☐ 385 ☒
PC ☒ 314 ☐
MCN ☒ 1017 ☐
Other ______

PORE SIZE
0.45 μm ☐ 0.8 μm ☐
0.1 μm ☐ 0.22 μm ☒
Other ______

G.O. Area (mm²) 0.0 094
No. of G.O. to Analyze 200

PREP

DIRECT PREP ☐
INDIRECT PREP ☐

Volume: 0 liters
Working Volume ______ ml
Weight ______ grams
Ashed Area ______ %

Prepared By: JAP.
Date: 8/26/10

ANALYSIS

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☒
H600C - Serial No. 542-24-03 ☒

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 ☒
Quantum System

Grid Address: ______
Screen Magnification: 20K X
Camera Constant: 2K2
Accelerating Voltage: 100KV
Beam Current: 10 μA
K-Factor: 1.4
Analyst: [illegible] Date: 8/26/10

Grid Opening	Structure Number	Structure	Width	Length	NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	Na	Mg	Si	Ca	Fe	Comments
C23		NSD ↓																							
C26																									
E23																									
E26																									
F23																									
F26																									
W23																									
W26																									
H23																									
H26																									
C3-1																									
C3-4																									
E3-1																									
E3-4																									
F3-1		↓																							

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

EMS LABORATORIES 117 West Bellevue Drive • Pasadena, California 91105-2503 • (626) 568-4065

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: A
Screen Magnification: 9/0 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radke Date 8/26

MICROSCOPE
- H600A - Serial No. 542-36-01 ☐
- H600B - Serial No. 542-05-06 ☑
- H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
- Kevex - Model No. 3200-0106-0365 ☐
- Kevex - Model No. 3600-0206-0146 Quantum System ☑

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E3-4		NF																							
G3-1																									
G3-4																									
B3-1																									
B3-4																									
C3-1																									
C3-3																									
C3-6																									
E3-3																									
E3-6																									
F3-3																									
F3-6																									
G3-3																									
G3-6																									
B3-3																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25-10

EMS Lab No. _____
Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: A
Screen Magnification: 9K X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Rad Date 8/26/10

MICROSCOPE
- H600A - Serial No. 542-36-01 ☐
- H600B - Serial No. 542-05-06 ☐
- H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
- Kevex - Model No. 3200-0106-0365 ☐
- Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
1B6		W,>n																							
K3-3																									
C4-1																									
C4-4																									
E4-1																									
E4-4																									
F4-1																									
F4-4																									
H4-1																									
H4-4																									
B4-6																									
C4-3																									
C4-6																									
E4-3																									
E4-6			↓																						

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 9100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radha Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
G3		NAD																							
C3-4																									
E3-1																									
E3-4																									
F3-1																									
F3-4																									
G3-1																									
G3-4																									
IB-1																									
IB-4																									
C3 3																									
C3 6																									
E3 3																									
E3 6																									
F3 3		Y																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank EMS Lab No. _____
Sample No. 8/25/10 Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 11KV X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Roth Date 8/20

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☑
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☑

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
F4-3		NAD																							
F4-6																									
G4-3																									
G4-6																									
H4-3																									
H4-6																									
E-1																									
E5-4																									
F5-1																									
F5-4																									
G5-4																									
H5-1																									
H5-4																									
I5-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank EMS Lab No. _____
Sample No. 8/25/10 Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 9700 X
Camera Constant: 28.7
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Rad Date 8/26/10

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☑
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☑

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C5-6		NM																							
E5-3																									
E5-6																									
I5-3																									
I5-6																									
W3																									
W5-6																									
I5-3																									
C6-1																									
C6-4																									
E6-1																									
E6-4																									
I6-1																									
I6-4																									
W6-1		↓																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: C
Screen Magnification: 9,900 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.14
Analyst Radha Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
G2-3		NAD																							
C26																									
E23																									
E26																									
F23																									
F26																									
G23																									
G26																									
H23																									
B34																									
C34																									
C34																									
E34																									
E34																									
I34																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: C
Screen Magnification: 9100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.14
Analyst Rate Date 8/20/10

MICROSCOPE
- H600A - Serial No. 542-36-01 ☐
- H600B - Serial No. 542-05-06 ☐
- H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
- Kevex - Model No. 3200-0106-0365 ☐
- Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
B3-6		NAM																							
C3-3																									
C3-6																									
E3-3																									
E3-6																									
F3-3																									
F3-6																									
G3-3																									
G3-6																									
B-3																									
B-6																									
C4-1																									
C4-4																									
E4-1																									
E4-4		↓																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: C
Screen Magnification: 9,100X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radke Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E4-4		NAD																							
G4-1																									
G4-4																									
H4-1																									
H4-4																									
C5-4																									
E5-1																									
E5-4																									
F5-1																									
F5-4																									
W5-1																									
W5-4																									
H5-1																									
H5-4																									
K5-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand Blank, EMS Lab No. _____
Sample No. 8-2540 Page 2 of _____

RECEIVING

ANALYSIS

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Address: D
Screen Magnification: 9,900 X
Camera Constant: 25.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Jade Date 8/26/10

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E4		N>n																							
G4-1																									
G4-4																									
H4-1																									
H4-4																									
C5-1																									
C5-4																									
E5-1																									
E5-4																									
F5-1																									
F5-4																									
G5-1																									
G5-4																									
H5-1																									
H5-4																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8-25-10

EMS Lab No. _____
Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: D
Screen Magnification: 9100X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radha Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
B3-4		NM																							
E3-1																									
E3-4																									
F3-1																									
F3-4																									
G3-1																									
G3-4																									
IB3-1																									
IB3-4																									
B4-4																									
C4-1																									
C4-4																									
E4-1																									
E4-4																									
F4-1		N																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank EMS Lab No. _____
Sample No. 8-25-10 Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: D
Screen Magnification: 9500X
Camera Constant: 21.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Zadle Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C5-3		NAD																							
C5-6																									
E5-3																									
E5-6																									
F5-3																									
F5-6																									
G5-3																									
G5-6																									
H5-3																									
H5-6																									
C6-1																									
C6-4																									
E6-1																									
E6-4																									
F6-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client: Sand blank
Sample No.: 8-25-10
EMS Lab No.: _____
Page: 1 of _____

RECEIVING

ANALYSIS

Grid Address: E
Screen Magnification: 9,100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.09
Analyst: Radke. Date: 8/26/10

MICROSCOPE
- H600A - Serial No. 542-36-01 ☐
- H600B - Serial No. 542-05-06 ☒
- H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
- Kevex - Model No. 3200-0106-0365 ☐
- Kevex - Model No. 3600-0206-0146 Quantum System ☒

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C2-3		NAD																							
C2-6																									
E2-3																									
E2-6																									
E2-3																									
E2-6																									
G2-3																									
G2-6																									
B3-4																									
C3-1																									
C3-4																									
E3-1																									
E3-4																									
G3-1																									
G3-4																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blnk EMS Lab No. _____
Sample No. 8-25-10 Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: E
Screen Magnification: 9,100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 14
Analyst Rene Date 8/26/10

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E4-4		NAD																							
E4-4		↓																							
E5-1																									
E5-4																									
F6-1																									

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM - 1B (1-08)

Spot Size Measurements

Scope: H-60B

Date: May 2010

Name: RS

Conditions of Measurements

High Voltage: 100K

Beam Current: 10 μA

Magnification: 19,200

Condenser Aperture Size: #2

Measurements from a photo 8.5

Shortest diameter: 8.5 **mm**

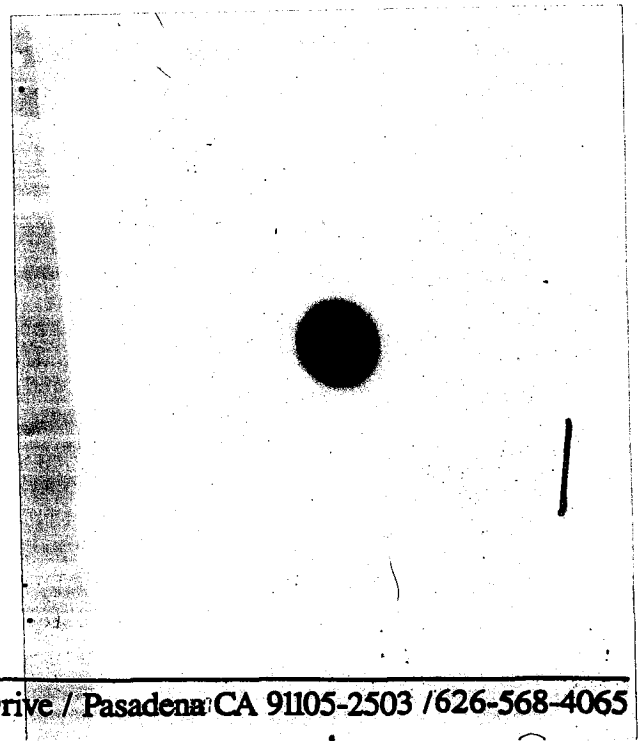
Longest diameter: 9 **mm**

Average: 8.75 **mm**

Spot Size Calculation

$$\text{Spot size in } \mu m = \frac{\text{(average spot size in mm) x 1000 } \mu m \text{ x 0.4125}}{\text{Magnification}}$$ 184

Note: 1.65/4 = 0.4125 (see the Hitachi Fax)



TEM CAMERA CONSTANT DETERMINATION

TEM H600B

Measured and Calculated by RJ Date May 2010

Camera Constant (mm A) = D (mm) X 1/2 X d (A)

where D (mm) is the diameter of a gold ring and

d (A) is the d-spacing in Angstroms for a particular reflection

CC (1*) = (24.1 mm) X 1/2 x 2.355 = 28.37

CC (2*) = (27.8 mm) X 1/2 x 2.039 = 28.34

CC (3*) = (39.3 mm) X 1/2 x 1.442 = 28.34

CC (4*) = (45.9 mm) X 1/2 x 1.230 = 28.23

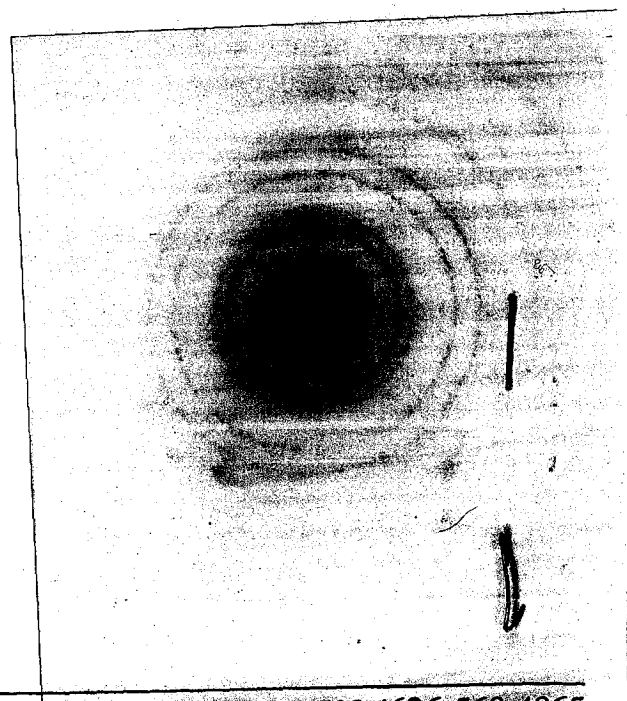
Average Camera Constant = 28.3

* 1 is the first largest diameter ring. 2 the second, etc.

Average Camera Constant = (CC<1> = ...= CC<n>) X 1/n

For gold:

d(A)	nk1
2.355	(111)
2.039	(200)
1.442	(220)
1.230	(311)
1.1774	(222)



08/07/01
csl

DATE: May 2010 A-600/B-600/C-600

WEEKLY CALIBRATION 3mo

MONTHLY CALIBRATION 3mth

AFTER SERVICE CALIBRATION___

BY: R

Measurement	Number of Spacing Flourescent Screen Magnification	Distance (mm)	Number of Spacing Film Magnification
	25,000x	12,000x	
1	3 5/16 = 19,260	5 1/2 =	9,180
2	3 5/16 = 19,260	5 1/16 1/2 =	9,270
3	3 1/16 = 19,080	5 1/16 1/2 =	9,270
4	3 1/16 = 19,080	5 1/2 =	9,180
5	3 5/16 = 19,260	5 1/2 =	9,180
6		5 1/2 =	9,180
7	ave 19,200		
8		ave	9,200
9			
10			
	AVERAGE:		

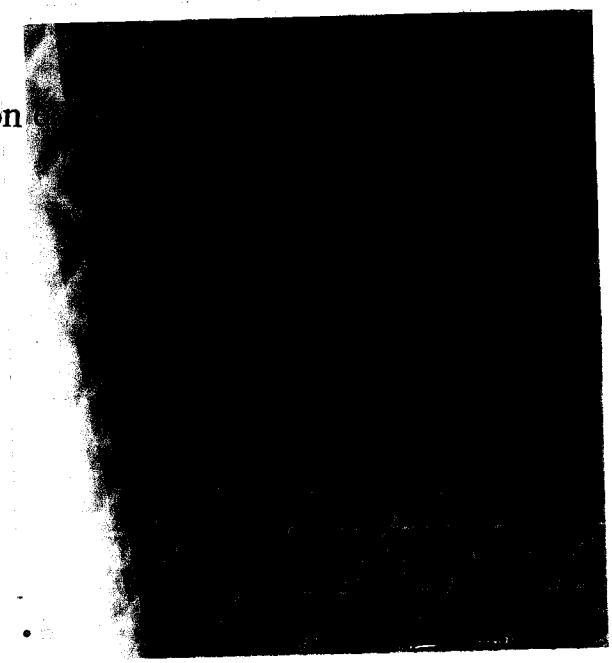
OPERATING VOLTAGE 100 KV

54, 864 lines/inch or 2,160 lines/mm or 0.463μm/line

28, 800 lines/inch or 1,134 lines/mm or 0.882μm/line

15, 240 lines/inch or 600 lines/mm or 1.67μm/line

16.94 μm for one bar and one opening for Ni screen on



EM CALIBRATION 2
992)

K= [Cn/C(Si)] / [In/I(Si)]
C(Si)= 18.74

n	Cn	RUN 1 I(Si)= 22860 In	Kn	RUN 2 I(Si)= 12101 In	Kn	RUN 3 I(Si)= 15953 In	Kn	RUN 4 I(Si)= 16554 In	Kn	RUN 5 I(Si)= 16203 In	Kn	RUN 6 I(Si)= 7464 In	Kn
Na	1.81	1694	1.3034	1095	1.0674	986	1.5627	1133	1.4112	1004	1.5587	395	1.8251
Mg	7.57	6992	1.3207	3738	1.3077	4447	1.4491	4902	1.3641	4714	1.3885	1983	1.5205
Al	6.54	7768	1.027	4152	1.0171	5455	1.0206	5761	1.0028	5708	0.9906	2576	1.0112
Si	18.74	22860	1	12101	1	15953	1	16554	1	16203	1	7464	1
K	0.97	1453	0.8144	827	0.7574	1311	0.6299	1333	0.6428	1195	0.7018	584	0.6615
Ca	8.26	6570	1.5336	3406	1.566	5845	1.203	5222	1.3973	4998	1.4289	2852	1.1535
Ti	3.02	2235	1.6483	1170	1.6668	1821	1.4118	1867	1.4289	1753	1.4895	928	1.2962
Mn	0.14	10	17.078	22	4.1092	12	9.9316	29	4.2645	2	60.523	22	2.5346
Fe	9.51	5898	1.9669	2935	2.0923	4934	1.6408	4856	1.73	4473	1.8383	2351	1.6111
O	43.83			7849	3.6059	7051	5.2917	10526	3.6783	9433	4.0174	3333	5.2377

** NVLAP REQUIREMENTS **
1.0 < K(Na) wrt Si < 4.0
1.0 < K(Mg) & K(Fe) wrt Si < 2.0
1.0 < K(Al) & K(Ca) wrt Si < 1.75

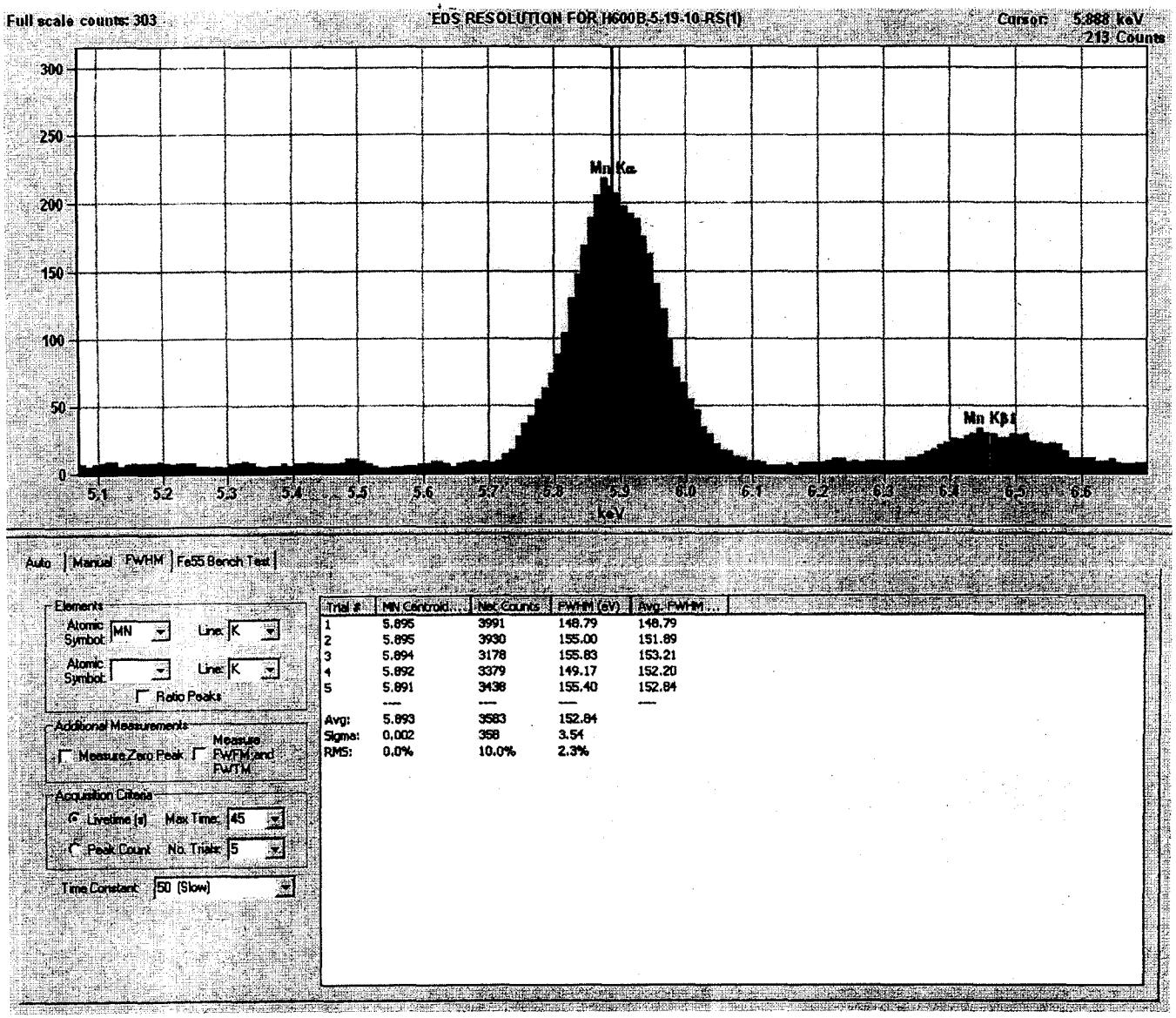
K(Mg)/K(Fe) < 1.5

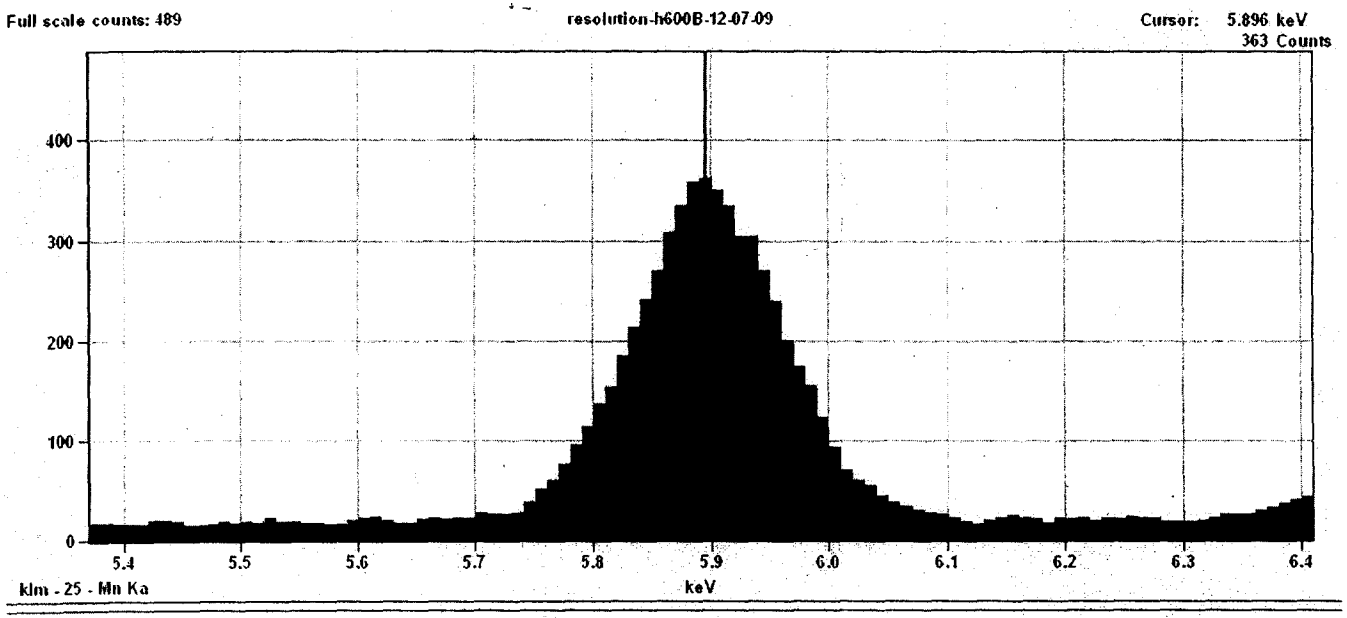
stdev <10% for Mg, Al, Si, Fe
stdev <20% for Na
wrt mean value of k-factor wrt Si

SCOPE B

RUN 7 I(Si)= 12627		RUN 8 I(Si)= 4491		RUN 9 I(Si)= 15830		RUN 10 I(Si)= 14684		RUN 11 I(Si)= 25368		RUN 12 I(Si)= 25374		RUN 13 I(Si)= 4628	
In	Kn	In	Kn	In	Kn	In	Kn	In	Kn	In	Kn	In	Kn
849	1.4365			950	1.6094	982	1.4442	1543	1.5879	1542	1.5893		
3523	1.4478	1332	1.362	4331	1.4765	4325	1.3715	7480	1.37	7479	1.3705	1213	1.5412
4458	0.9885	1569	0.9989	5717	0.9663	5043	1.0162	9260	0.9561	9260	0.9563	1556	1.038
12627	1	4491	1	15830	1	14684	1	25368	1	25374	1	4628	1
1099	0.5947	415	0.5601	1505	0.5444	1185	0.6414	2315	0.5672	2318	0.5666	363	0.6599
4553	1.2224	1818	1.0888	6257	1.1151	4602	1.4064	9813	1.1394	9832	1.1375	1754	1.163
1480	1.3749	563	1.2855	1994	1.2794	1703	1.3895	3188	1.2823	3196	1.2794	510	1.4624
4	23.583	13	2.5808	7	16.894			25	7.5806			6	5.7624
3889	1.6477	1422	1.6027	5899	1.3618	4371	1.7048	8840	1.4563	8884	1.4494	1497	1.5689
6102	4.8398	1894	5.5458	5950	6.2225	9471	3.6262	35609	1.6662	13315	4.4571	2045	5.293

SCOPE B


Full scale counts: 303
EDS RESOLUTION FOR H600B 5-19-10 RS(1)
Cursor: 5.888 keV
213 Counts
300
250
200
150
100
50
0
Mn Kα
Mn Kβ1
5.1
5.2
5.3
5.4
5.5
5.6
5.7
5.8
5.9
6.0
6.1
6.2
6.3
6.4
6.5
6.6
keV
Auto
Manual
FWHM
Fe55 Bench Test
Elements
Atomic Symbol: MN
Line: K
Atomic Symbol:
Line: K
Ratio Peaks
Additional Measurements
Measure Zero Peak
Measure FWFM and FWTM
Acquisition Criteria
Livetime [s]
Max Time: 45
Peak Count
No. Trials: 5
Time Constant: 50 (Slow)
Trial #
MN Centroid...
Net Counts
FWHM (eV)
Avg. FWHM...
1 5.895 3991 148.79 148.79
2 5.895 3930 155.00 151.89
3 5.894 3178 155.83 153.21
4 5.892 3379 149.17 152.20
5 5.891 3438 155.40 152.84
Avg: 5.893 3583 152.84
Sigma: 0.002 358 3.54
RMS: 0.0% 10.0% 2.3%



Auto | Manual | FWHM | Fe55 Bench Test

Elements

Atomic Symbol: Mn Line: K

Atomic Symbol: Line: K

Ratio Peaks

Additional Measurements

Measure Zero Peak Measure FWFM and FWTM

Acquisition Criteria

Livetime (s) Max Time: 50

Peak Count No. Trials: 5

Time Constant: 50 (Slow)

Trial #	Mn Centroid ...	Net Counts	FWHM (eV)	Avg. FWHM ...
1	5.896	1277	126.16	126.16
2	5.900	5295	151.73	138.95
3	5.897	6460	146.02	141.30
4	5.898	5560	146.26	142.54
5	5.899	5291	133.62	140.76
	---	---	---	---
Avg:	5.898	4776	140.76	
Sigma:	0.001	2014	10.52	
RMS:	0.0%	42.2%	7.5%	

141276

Laboratory Submittal Form

Date:		Time:	
Client:	Northgate Environmental		
Address:			
Telephone:	949-375-7004		
Contact:	Cindy Arnold		

Relinquished by:
Date of Shipment:
Shipped from:
Client P.O. No:
Client Project ID: 02027.01.2161

Results via: ☐ Fax No: ☐ Email address: ☐ Verbal

(Complete written reports will follow all analyses, in addition to any prior verbal, fax, or email results)

Turnaround Time:	Other:	Sample Preservatives:	
Number of Samples:	6	Sampler's Name:	
Date & Time of Sample Collection:	10/28/10	Holding Times:	Signature:

Type: ☐ Water ☐ Waste Water ☐ Soil ☐ Filter ☐ Impinger ☐ Sorbent Tube ☐ Other

EMS Only		Client Sample No.	Description/Location	Analysis	Volume/ Weight
	1	SSAN5-05-0.00_01_BPC		TEM	
	2	SSAN5-05-0.33_01_BPC	**HOLD**		
	3	SSAN4-01-0.00_01_BPC			
	4	SSAN4-01-0.33_01_BPC	**HOLD**		
	5	SSAP8-02-0.00_01_BPC			
	6	SSAP8-02-0.33_01_BPC	**HOLD**		
	7				
	8		SEE ATTACHMENT		
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				

141276

For EMS Only

Laboratory Number:		Received by:	Time: 9:36
Date of Package Delivery:	11/1/2010	Shipping Bill Retained?	NONE
Condition of Package on Receipt:	OK	Condition of Custody Seal:	NONE
Number of Samples:	6	Chain of Custody Signature:	
Disposition of Samples:	EMS LABS	Misc. Info:	SF 7/06

northgate
environmental management, inc.
24411 Ridge Route Drive, Suite 130
Laguna Hills, California 92653

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

141276

Page: 1 of 1
Cooler # of

COC # 02027.01.2161
Total # of Samples: 6 Event Complete?

Required Ship to Lab:		Required Project Information:		Required Invoice Information:			
Lab Name:	EMS Laboratories, Inc.	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:			
Address:	117 W Bellevue Dr	Project #	2027.01.63	Address:	PO Box 55		
	Pasadena, CA 91105	Site Address	560 W Lake Mead Pkwy	City/State:	Henderson, NV 89009	Phone #:	(949) 260-9293
Lab PM:	Tony Kolk	City	Henderson	State, Zip	NV, 89015	PO #	
Phone/Fax:	626-568-4065	Site PM Name	Derrick Willis	Send EDD to	Frank.Hagar@ngem.com		
Lab PM email	akolk@emslabs.com	Phone/Fax:	(949)375-7004	CC Hardcopy report to	PDF Electronic Version Only -- FTP Upload		
Applicable Lab Quote #:		Site PM Email:	derrick.willis@ngem.com	CC Hardcopy report to			

										Regular			Rush	X	Mark One
ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	Comments/Lab Sample I.D.	Analysis Requested	Preservative UNPRES	PhB-Asbestos			
1	SSAN5-05-0.00_01_BPC	SSAN5-05	SO	C	N	10/28/2010	15:45	3	PCS Soil (RZ-C)			X			
2	SSAN5-05-0.33_01_BPC	SSAN5-05	SO	C	N	10/28/2010	16:00	3	PCS Soil (RZ-C); HOLD			H			
3	SSAN4-01-0.00_01_BPC	SSAN4-01	SO	C	N	10/28/2010	17:30	3	PCS Soil (RZ-C)			X			
4	SSAN4-01-0.33_01_BPC	SSAN4-01	SO	C	N	10/28/2010	17:39	3	PCS Soil (RZ-C); HOLD			H			
5	SSAP8-02-0.00_01_BPC	SSAP8-02	SO	C	N	10/28/2010	16:38	3	PCS Soil (RZ-B)			X			
6	SSAP8-02-0.33_01_BPC	SSAP8-02	SO	C	N	10/28/2010	16:50	3	PCS Soil (RZ-B); HOLD			H			

Additional Comments/Special Instructions:

5-day RUSH TAT or best available

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
VAA	10/29/10	17:36		10/29/10	17:36

Sample Receipt Conditions

	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?

SHIPPING INFO

Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Francisco Barron, NGEM

SIGNATURE of SAMPLER: Francisco Barron

DATE Signed: 10/29/10

10/29/2010 Time: 17:36