

Laboratory Report

K & L Gates
 17 North Second Street
 18th Floor
 Harrisburg, PA 17101
 United States
 Attention: Mr. David Raphael
 Telephone: 717-231-4504

Report Date 06/27/2019
 Sample Receipt Date 05/30/2019
 RJ Lee Group Job No. LLH901997-7
 Authorization/P.O. No.
 Client Job No./Name

Analysis: Asbestos in Bulk Samples by Point Count
 Method: EPA/600/R-93/116

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158807.HPL	#1 - DB-1	Yes	1	0.10 AC	0.20 OF	99.70	Q, AM, OP, M	DF-06/26/2019
Description: Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actin. Cleavage								
Weight Loss: 0.0%								
3158808.HPL	#2 - DB-2	Yes	1	ND		100.00	Q, AM, OP, M	DF-06/27/2019
Description: Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%								
Weight Loss: 0.0%								
3158809.HPL	#3 - DB-3	Yes	1	ND		100.00	Q, AM, OP, M	DF-06/27/2019
Description: Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%								
Weight Loss: 0.0%								

Client Job No./Name: RJ Lee Group Job No: LLH901997-7

Client Job No./Name: RJ Lee Group Job No: LLH901997-7

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
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Authorized Signature:

Donald Fike

ASBESTOS

- AM = Amosite
- AC = Actinolite
- AN = Anthophyllite
- CH = Chrysotile
- CR = Crocidolite
- TR = Tremolite
- CE = Cellulose
- MW = Mineral Wool
- FG = Fibrous Glass
- SF = Synthetic Fibers
- H = Hair
- W = Wollastonite
- OF = Other Fibers

NON-ASBESTOS

- AM = Amphibole
- B = Binder
- CA = Carbonates
- CL = Clay
- F = Feldspar
- G = Gypsum

NON-FIBROUS MATERIALS

- HY = Hydromagnesite
- M = Miscellaneous
- MI = Mica
- OP = Opaque
- OR = Organic
- P = Perlite
- Q = Quartz
- T = Tar
- V = Vermiculite

DISCLAIMER NOTES

- "ND" indicates no asbestos was detected; the method detection limit is 0.1%.
- "Trace" or "<math> < /math>" indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.25% to 0.32 at high fiber concentrations.
- Samples are archived for three months following analysis and are then properly discarded.
- These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.
- This test report relates to the items tested.
- This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory.
- Any reproduction of this document must be in full in order for the report to be valid.
- This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency.
- Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing."
- Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility.
- If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory results are limited to the reported values.
- $((100-A)/B) \times C$ = Asbestos Detected (%), where A=weight loss, B=total # of points counted, and C=total # of asbestos fibers counted.

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 06/25/19 Analyst: DF Scope: 336-0PT

Sample Description: Gray Crushed Rock

RJ Lee Group
 Sample Number: 3158807
 RJ Lee Group
 Project Number: LLH901997-7
 Analysis Method:

Comments /
 # of Layers: 1000 pt count. Detection Limit = 0.1%

Stereo-scope	%	Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Birefringence	Sign of Elongation	Extinction Angle	NFM%
					⊥		⊥	Y N	Y N	Y N	
	0.1	Frem Actin actin/AF	WCS	GR	Col	1.634	1.627	L (M)	(P) N		Quartz Carbonates Vermiculite Tar Binder Opales Perlite Amphibole Gypsum Talc Feldspar Mica Clay Organic Part. Diatoms Misc Particles Foam Foil
			WCS					L M	P N		
			WCS					L M	P N		
		% Non-Asbestos Fibers		Optical Properties	Layered Results			Asbestos	Non-Asb.	Matrix	
	0.2	Actin. Clev.		R.I.							

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	99	100	99	99	100	100	100	100	797
Clev.	0	0	1	1	0	0	0	0	2
Asb	1	0	0	0	0	0	0	0	1
Total	100	100	100	100	100	100	100	100	800

Effective Date: March 2019
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PLM Point Count Additional Slides Worksheet

 Date: 06/25/19 Analyst: DF Microscope: 036-0PT

 RJ Lee Group Sample Number: 3158807 RJ Lee Group Project Number: LLH901997-7

Type	Slide <u>9</u>	Slide <u>10</u>	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
NAS	100	100							200
clev.	0	0							0
Asb	0	0							0
Total	100	100							1000

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 06/26/19 Analyst: DF Scope: 036-0PT

Sample Description: Gray Crushed Rock

RJ Lee Group
 Sample Number: 3158808
 RJ Lee Group
 Project Number: LLH901997-7
 Analysis Method:

Comments /
 # of Layers: 1000 pt count . Detection Limit = 0.1%

Stereo-scope	%	Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Homogenous		QC		QC Analyst:
					⊥		⊥	Y	N	Y	N	
		<u>ND</u>	<u>W C S</u>					<u>L M</u>	<u>P N</u>			
			<u>W C S</u>					<u>L M</u>	<u>P N</u>			
			<u>W C S</u>					<u>L M</u>	<u>P N</u>			
		% Non-Asbestos Fibers		Optical Properties		Layered Results		Asbestos	Non-Asb.	Matrix	NFM%	
											<u>Quartz?</u> Carbonates Vermiculite Tar Binder <u>Opakes</u> Perllite <u>Amphibole</u> Gypsum Talc Feldspar Mica Clay Organic Part. Diatoms <u>Misc Particles</u> Foam Foli	

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
<u>NAS</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>
<u>cle</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Asb</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>

Effective Date: March 2019
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PLM Point Count Additional Slides Worksheet

Date: 06/26/19 Analyst: DF Microscope: 036-0PT

RJ Lee Group Sample Number: 3158808 RJ Lee Group Project Number: LLH901997-7

Type	Slide <u>9</u>	Slide <u>10</u>	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
NAS	100	100							200
cle	0	0							
Asb	0	0							
Total	100	100							1000

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 06/26/19 Analyst: DF Scope: 036-0PT

Sample Description: Gray Crushed Rock

RJ Lee Group
 Sample Number: 3158809
 RJ Lee Group
 Project Number: LLH 901997-7
 Analysis Method:

Comments / # of Layers: 1000 pt. Count. Detection Limit = 0.1%

Stereo-scope	%	%	Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Birefringence	Sign of Elongation	Extinction Angle	NFM%
						⊥		⊥				
			<u>ND</u>	<u>WCS</u>					<u>L M</u>	<u>P N</u>		<u>Quartz</u> Carbonates Vermiculite
				<u>WCS</u>					<u>L M</u>	<u>P N</u>		Tar Binder <u>Opauques</u>
				<u>WCS</u>					<u>L M</u>	<u>P N</u>		Perlite <u>Amphiboles</u> Gypsum
			% Non-Asbestos Fibers		Optical Properties		Layered Results		Asbestos	Non-Asb.	Matrix	Talc Feldspar Mica
												Clay Organic Part. Diatoms
												<u>Misc Particles</u> Foam Foil

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
<u>NAS</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>
<u>cle</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Asb</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>

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PLM Point Count Additional Slides Worksheet

Date: 06/26/19 Analyst: DF Microscope: 036-0PT

RJ Lee Group Sample Number: 3158809 RJ Lee Group Project Number: LL4901997-7

Type	Slide <u>9</u>	Slide <u>10</u>	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
<u>NAs</u>	<u>100</u>	<u>100</u>							<u>200</u>
<u>cle</u>	<u>0</u>	<u>0</u>							
<u>Asb</u>	<u>0</u>	<u>0</u>							
Total	<u>100</u>	<u>100</u>							<u>1000</u>

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 06/27/19 Analyst: DF Scope: 036-005

Sample Description: Gray Crushed Rock

RJ Lee Group
 Sample Number: 3158810
 RJ Lee Group
 Project Number: LLH 901997-7
 Analysis Method:

Comments / # of Layers: 1000 pt count. Detection Limit = 0.1%

Stereo-scope	%		Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Homogenous		QC		QC Analyst:
	%	%				⊥		⊥	Y	N	Y	N	
			<u>ND</u>	<u>WCS</u>					<u>L</u>	<u>M</u>	<u>P</u>	<u>N</u>	
				<u>WCS</u>					<u>L</u>	<u>M</u>	<u>P</u>	<u>N</u>	
				<u>WCS</u>					<u>L</u>	<u>M</u>	<u>P</u>	<u>N</u>	
			% Non-Asbestos Fibers		Optical Properties		Layered Results		Asbestos	Non-Asb.	Matrix		

- Quartz Carbonates Vermiculite
- Tar Binder Opacities
- Perlite Amphibole Gypsum
- Talc Feldspar Mica
- Clay Organic Part. Diatoms
- Misc Particles Foam Foil

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
<u>NAS</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>
<u>Clc</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Ash</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>

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PLM Point Count Additional Slides Worksheet

Date: 06/27/19 Analyst: DF Microscope: 036-0PT

RJ Lee Group Sample Number: 3158810 RJ Lee Group Project Number: LL1901997-7

Type	Slide <u>9</u>	Slide <u>10</u>	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
NAS	100	100							200
cle	0	0							
Asb	0	0							
Total	100	100							1000

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 02/27/19 Analyst: DF Scope: 055-APT
019-APT
02/27/19 DF Sample Description: Gray Crushed Rock

RJ Lee Group
 Sample Number: 3158811
 RJ Lee Group
 Project Number: LLH901997-7
 Analysis Method:

Comments /
 # of Layers: 1000 pt count. Detection Limit = 0.1%

Stereo-scope	%	Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Birefringence	Sign of Elongation	Extinction Angle	NFM%
					⊥		⊥				
	<u>ND</u>		W C S					L M	P N		Quartz
			W C S					L M	P N		Carbonate
			W C S					L M	P N		Vermiculite
											Tar
											Blinder
											Opaques
											Perlite
											Amphibole
											Gypsum
											Talc
											Feldspar
											Mica
											Clay
											Organic Part.
											Diatoms
											Misc Particles
											Foam
											Foli

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
<u>NAS</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>99</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>799</u>
<u>clev</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
<u>Asb</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	100	100	100	100	100	100	100	100	800

Effective Date: March 2019
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PLM Point Count Additional Slides Worksheet

Date: ^{06/27/19 PF} ~~3158811~~ 06/27/19 Analyst: DF Microscope: ^{055-GPT} ~~019-021~~ 06/27/19 PF

RJ Lee Group Sample Number: 3158811 RJ Lee Group Project Number: LLH901997-7

Type	Slide <u>9</u>	Slide <u>10</u>	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
NAS	100	100							999
clev	0	0							1
Asb	0	0							0
Total	100	100							1000

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 06/27/19 Analyst: DF Scope: GSS-OPT

Sample Description: White Crushed Rock

RJ Lee Group
 Sample Number: 3158812
 RJ Lee Group
 Project Number: LLH901997-7
 Analysis Method:

Comments / # of Layers: 1000 Pt count. Detection Limit = 0.1%

Stereo-scope	%	%	Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Homogenous		QC		QC Analyst:
						⊥		⊥	Y	N	Y	N	
			<u>ND</u>	<u>W C S</u>					<u>L M</u>	<u>P N</u>			
				<u>W C S</u>					<u>L M</u>	<u>P N</u>			
				<u>W C S</u>					<u>L M</u>	<u>P N</u>			
			% Non-Asbestos Fibers		Optical Properties		Layered Results		Asbestos	Non-Asb.	Matrix		

- NFM%
- Quartz
 - Carbonates
 - Vermiculite
 - Tar
 - Binder
 - Opakes
 - Perlite
 - Amphibole
 - Gypsum
 - Talc
 - Feldspar
 - Mica
 - Clay
 - Organic Part.
 - Diatoms
 - Misc Particles
 - Foam
 - Foil

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
<u>NAS</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>
<u>Clev</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
<u>Asb</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>800</u>

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 06/27/19 Analyst: DF Scope: OSS-OPT

Sample Description: Gray Crushed Rock

RJ Lee Group
 Sample Number: 31578813
 RJ Lee Group
 Project Number: LL14901997-7
 Analysis Method:

Comments / # of Layers: 1000 pt count. Detection Limit = 0.1%

Stereo-scope	%	Asbestos Type	Morphology	Color/Pleochroism		Indices of Refraction		Birefringence	Sign of Elongation	Extinction Angle	NFM%
					⊥		⊥				
	0.1%	Actin	WCS	Gr	Col	1.634	1.627	L (M)	(P) N	PL	Quartz Carbonates Vermiculite Tar Binder Opaques Perlite Amphibole Gypsum Talc Feldspar Mica Clay Organic Part. Diatoms Misc Particles Foam Foil
			WCS					L M	P N		
			WCS					L M	P N		
		% Non-Asbestos Fibers		Optical Properties		Layered Results		Asbestos	Non-Asb.	Matrix	
	0.4%	Actinolite Clev.		R.I.							

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	98	99	99	99	100	100	795
CLC	0	0	2	1	0	1	0	0	4
Asb	0	0	0	0	1	0	0	0	1
Total	100	100	100	100	100	100	100	100	800

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PLM Point Count Additional Slides Worksheet

Date: 06/27/19 Analyst: DF Microscope: 055-0PT

RJ Lee Group Sample Number: 3158813 RJ Lee Group Project Number: LLH901997-7

Type	Slide <u>9</u>	Slide <u>10</u>	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
NAS	100	100							995
Cle	0	0							4
Asb	0	0							1
Total	100	100							1000

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									

Type	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Slide ____	Total
Total									