

**ASBESTOS TEM LABORATORIES, INC.**

**EPA Quantitative Bulk Test Method  
Transmission Electron Microscopy  
Analytical Report**

**Laboratory Report # 365259**

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ASBESTOS TEM LABORATORIES, INC

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Aug/09/2019

Monalisa Wallace  
Safe Sand Company  
2912 Diamond St No 331  
SF, CA, 94131

RE: LABORATORY REPORT #365259

Transmission electron microscopy analytical results for 2 bulk material sample(s).  
Job Site: Monterey CA/Ontario, CAN  
Job No.:

Please find below the results for the TEM analysis of one or more bulk material samples. The analytical procedures were performed according to the EPA Test Method For the Determination of Asbestos in Bulk Building Materials - TEM method (EPA 600/R-93/116) modified for quantitative bulk soil sample analysis. Prior to analysis, each sample was logged-in and all pertinent data was recorded. Each sample was checked for damage and disruption of any chain-of-custody seals. A unique laboratory number was assigned to each sample. A hard copy Log-In sheet was generated. This, and all other relevant paper work was kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation followed a standard CARB 435 prep method. The entire sample was dried at 135-150 C and then crushed to ~3/8" gravel size. If the submitted sample was >~1 quart, the sample may have been split using a 1/2" riffle splitter following ASTM Method C-702-98 to reduce the sample volume for pulverization. The remaining aliquot, or entire original sample, was then pulverized in a Bico Braun disc pulverizer calibrated to produce a nominal 200 mesh final product. A representative ~60 mg aliquot of material was weighed out, and then placed into solution in a 500 ml beaker filled with distilled water. A known volume of the liquid suspension was filtered onto a 0.2 micron pore size Millipore mixed cellulose ester filter. The filter was then dried in HEPA filtered, Class 100 air on a clean bench. The filter was placed onto a glass microscope slide, sectioned, and collapsed in acetone. The collapsed filter was plasma-etched to remove 10% of the filter surface and then carbon coated. The carbon coated filter was sectioned and the sections placed onto 200-mesh copper TEM sample grids in dimethyl sulfoxide and acetone wick washers. After sufficient time to dissolve the filter material, the TEM sample grids were removed from the baths and placed into labeled sample containers.

TEM analysis was performed on a Philips CM-12 or JEOL 1200 transmission electron microscope operating at 80 or 100 kV. The sample was placed into the microscope where it was first scanned at low magnification to confirm that the distribution of material was reasonably homogeneous. High magnification analysis was performed using a two tier approach: 1) A relatively large area of several TEM grid openings for large asbestos fibers or fiber bundles, and 2) a relatively small area of a number of fields of view for individual asbestos fibers (fibrous particles exhibiting an aspect ratio greater than or equal to 3 to 1, and a length greater than or equal to .5 um). Detected asbestiform structures were subjected to detailed morphological and/or selected area diffraction analysis. If necessary, energy dispersive X-ray analysis was also performed. The length and width of each asbestos fiber was measured. From this data, a total volume and mass of asbestos observed in the scanned area is calculated, and extrapolated to a total weight percent asbestos for each sample.

Sincerely Yours,

A handwritten signature in black ink, appearing to read "R. Mc. Burt", written in a cursive style.

Laboratory Manager

--- These results relate only to the samples tested and must not be reproduced, except in full, with the approval of the laboratory. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. ---

# TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Monalisa Wallace	REPORT NO. <b>365259</b>
Address: Safe Sand Company 2912 Diamond St No 331 SF, CA, 94131	Date: <u>Aug-09-19</u>
Job Site / No.: Monterey CA/Ontario, CAN	Date Received: <u>Jul-30-19</u>
	Total Samples Analyzed: 2

SAMPLE DESCRIPTION	
Client Sample # <span style="border: 1px solid black; padding: 2px;">1</span>	<b>CA beach sand</b>
Laboratory Sample # <span style="border: 1px solid black; padding: 2px;">96-02938-001</span>	

SAMPLE PREPARATION PARAMETERS			
Weight of Material Suspended (mg):	<u>62.6</u>	Filter Type & Pore Size	<u>MCE0.22um</u>
Volume of Suspension Water (ml):	<u>500</u>	Effective Filter Area (sq.mm)	<u>346</u>
Volume of Suspension Filtered (ml):	<u>0.5</u>		

ASBESTOS STRUCTURES DETECTED IN SCAN AREA				CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)		
<b>CHRYBOTILE</b>		<b>AMPHIBOLE</b>		<b>CHRYBOTILE</b>	<b>AMPHIBOLE</b>	<b>TOTAL</b>
<u>&lt; 5 µm</u>	<u>≥ 5 µm</u>	<u>&lt; 5 µm</u>	<u>≥ 5 µm</u>			
<b>NSD</b>	<b>NSD</b>	<b>1</b>	<b>NSD</b>	<b>&lt;0.001</b>	<b>0.004</b>	<b>0.004</b>

COMMENTS	
Actinolite Asbestos Detected.	Filter Loading: Moderate SAED Photo ID Nos.

TEM / ANALYTICAL PARAMETERS					
Grid Op. # Scanned For Large Fibers & Bundles	<u>20</u>	Grid Area (sq.mm)	<u>0.0097</u>	Bundle Scan Area (sq.mm)	<u>0.194</u>
Grid Op. # Scanned For Small Fibers & Bundles	<u>20</u>	Grid Area (sq.mm)	<u>0.0097</u>	Fiber Scan Area (sq.mm)	<u>0.194</u>
		Magnification:	<u>15,000</u>		

**NOTATION KEY**

Chrys. - Chrysotile Asbestos      1 µm = 1 micron = 0.001 mm  
 Amph. - Amphibole Asbestos      1 mm = 1 millimeter  
 NSD - No Structures Detected      1 sq.mm = 1 square millimeter  
 Non-Asb. - Non-Asbestos          1 cc = 1 cubic centimeter

*Hei Mei Sheng*  
 Analyst Signature

*R. Mc...*  
 Lab QC Reviewer Signature

# TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

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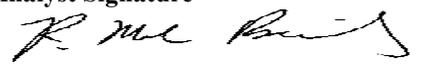
SAMPLE DESCRIPTION	
Client Sample # <span style="border: 1px solid black; padding: 2px;">2</span>	<b>Safe sand-white inert feldspathic sand</b>
Laboratory Sample # <span style="border: 1px solid black; padding: 2px;">96-02938-002</span>	

SAMPLE PREPARATION PARAMETERS			
Weight of Material Suspended (mg): <u>62.5</u>	Filter Type & Pore Size <u>MCE0.22um</u>		
Volume of Suspension Water (ml): <u>500</u>	Effective Filter Area (sq.mm) <u>346</u>		
Volume of Suspension Filtered (ml): <u>0.5</u>			

ASBESTOS STRUCTURES DETECTED IN SCAN AREA				CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)		
<b>CHRYSOTILE</b>		<b>AMPHIBOLE</b>		<b>CHRYSOTILE</b>	<b>AMPHIBOLE</b>	<b>TOTAL</b>
<u>&lt; 5 µm</u>	<u>≥ 5 µm</u>	<u>&lt; 5 µm</u>	<u>≥ 5 µm</u>			
<b>NSD</b>	<b>NSD</b>	<b>NSD</b>	<b>NSD</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
COMMENTS						
No Asbestos Detected.				Filter Loading: Moderate SAED Photo ID Nos.		

TEM / ANALYTICAL PARAMETERS					
Grid Op. # Scanned For Large Fibers & Bundles <u>20</u>	Grid Area (sq.mm) <u>0.0097</u>	Bundle Scan Area (sq.mm) <u>0.194</u>			
Grid Op. # Scanned For Small Fibers & Bundles <u>20</u>	Grid Area (sq.mm) <u>0.0097</u>	Fiber Scan Area (sq.mm) <u>0.194</u>			
Magnification: <u>15,000</u>					

NOTATION KEY	
Chrys. - Chrysotile Asbestos	1 µm = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos	1 mm = 1 millimeter
NSD - No Structures Detected	1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos	1 cc = 1 cubic centimeter

  
 Analyst Signature  
  
 Lab QC Reviewer Signature

