INTER-OFFICE COMMUNICATION

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From: A. Davidson

Subject: Vermiculite Ore-Asbestos Monitoring

Date: April 2, 1980

Samples of Vermiculite ore from Grace-Libby, Virginia, and American Vermiculite-African prepared per the Grace concentration scheme were submitted to McCrone Associates for asbestos analysis on January 30, 1980. Samples were analyzed by x-ray diffraction and polarized light microscopy/dispersion staining. Results are as follows:

A. X-ray diffraction studies showed the presence of 3-5% amphibole in 1) Virginia vermiculite -100, -70 + 100, and heavy expanded fractions from Pole Bldg. in Virginia; 2) Virginia vermiculite -100 fraction railcar B & D 60370 collected here; and 3) Libby -100 fraction railcar BN 455698 collected here. Small quantities of amphibole were indicated in Virginia vermiculite -70 + 100 fraction railcar B & D 603970 collected here.

B. Polarized Light Microscopy and Dispersion Staining. Analysis by this technique revealed that the amphibole content of the above samples to be mostly hornblendes. In addition to the above tremolite-actinolite was found in 1) Virginia vermiculite -100 and heavy expanded fractions from Pole Bldg. in Virginia; 2) Virginia vermiculite -100 and -70 + 100 fractions railcar B & D 603970 collected here; and 3) Libby -100 and heavy expanded railcar BN 455698 collected here at the 0.5-1% level.

C. No asbestos minerals were detected in any of the other samples which include the African ore fractions. African ore sample obtained from Portsmouth.

D. Tremolite-actinolite was the only type of asbestos mineral found.

E. The tremolite-actinolite in fractions -100 Virginia collected here and Libby -100 and heavy expanded is of the asbestiform variety.

F. From the optical studies it appears that the tremolite-actinolite in fractions -100 and heavy expanded Virginia from Pole Bldg. in Virginia and the -70 + 100 Virginia collected here is present in the massive form rather than the asbestiform. Would probably still be considered asbestos under present government regulations.

EXHIBIT
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Ore Sample	% Asbestos	
	Hornblende	Tremolite-Actinolite
Virginia-Pole Bldg.	0.71 - 1.17	0.06 - 0.103
Virginia-Railcar	0.23 - 0.39	0.04 - 0.08
Libby-Railcar	0.03 - 0.06	0.09 - 0.176
African-Portsmouth	- 0 -	- 0 -

Although hornblende has been mentioned as being present in vermiculite ore (Dr. Duecker-Grace Research) this is the first time I recall McCrone finding it in any samples submitted to them especially at this level. Hornblende is not classified as asbestos. The chemical and structual properties of hornblende are similar to tremolite-actinolite. The major difference is that hornblende contains much higher levels of aluminum.

The second set of samples will be submitted for analysis soon. Still need to obtain sample of African from Portsmouth and Virginia from Virginia.

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