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INFORMAL REPORT

TO: Mr. J. L. Myers

CC: Messrs. R. E. Byrne, Jr.
E. W. Shortridge
W. C. Thurber

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Work By: B. L. Ingalls & G. J. Spencer
Written By: H. B. Rhodes

THE OCCURRENCE OF ULTRA-FINE FIBERS IN "CALIDRIA" RG-244 ASBESTOS

SUMMARY AND CONSULSIONS

During the latter half of 1977 several very high fiber counts, i.e., 20-40 fibers/cc, occurred during customer use of RG-244. The counts were associated with large amounts of extremely fine diameter fibers in the air samples. It was not clear whether these fibers were due to a change in the product or had been present in the past and gone undetected.

In order to answer this question sixty-five filters from 36 customer locations collected in the time period of 1973-1977 were recounted. Extreme care and attention was devoted to the detection of ultra-fine fibers. The results obtained support the following:

1. Prior to 1975 ultra-fine fibers were probably not present in measurable amounts.

2. After the expanded plant went on-stream in 1975 until mid-~~1979~~ 1977 such fibers were present at 30-45% of locations tested in sufficient quantitites to yield maximum ceiling airborne concentrations that were generally in the 1-3 fiber/cc range.

3. During the spring of 1977 occasional batches of product were made that contained a sharply increased amount of fines. This was possibly due to increased throughput through the dryer. These products resulted in several 20-40 fibers/cc counts.

4. The sudden appearance of high counts was real and not a result of prior counting omissions.

5. Only one customer test has been run in 1978. The fines are therefore being checked with regular bagger samples obtained at the plant. This work will be reported elsewhere.

BACKGROUND

Union Carbide has provided an asbestos fiber counting service to customers since 1973. In the time period 1973-1977 about 45 counts were made during the commercial handling of RG-244 asbestos. The highest results obtained until about the middle of 1977 were less than 3 fibers/cc with values under 1 fiber/cc most typical. A summary of these counts, taken from the October 1, 1977 update of the "Calidria Asbestos RG-244 Health and OSHA Information" brochure is shown in Tables I, II and II. These tables include all of the available RG-244 results available through August 1977 except for a couple of filters that were known to be heavily contaminated with Nytal tremolitic talc.

PLAINTIFF'S EXHIBIT
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BACKGROUND (Cont'd.)

In the later part of 1977 counts in the 20-40 fiber/cc range occurred at three customer locations, one of which was in confirmation of a very high count found by an OSHA inspector. These high counts were largely due to the presence of a great multiplicity of extremely fine diameter fibers at the limit of detection of the counting method used. A long-time customer, Chrysler, who used excellent dust control equipment, also mentioned informally at that time that their counts which in the past had been in the low tenths of a fiber/cc now showed an occasional result in the 1-2 fiber/cc range.

OBJECTIVE OF THE PRESENT STUDY

The recent detection of large quantities of fine fiber in several RG-244 customer tests can be accounted for in two ways:

1. Ultra-fine material has always been present, at least sporadically, and has largely escaped detection in the past.

2. The occurrence in sufficient quantities to cause the high dust counts is the result of a recent change in the product, i.e., since about mid-1977.

The objective of this study was to distinguish, to the extent practicable, between these two alternatives.

THE ANALYTICAL PROBLEM

Asbestos fibers are counted with an optical microscope at 400-450X using phase contrast illumination. Only fibers longer than 5μ with L/D ratios greater than 3 are counted. The 5μ length does not present any particular difficulty but as the diameters become smaller, the limit of resolution of the microscope is reached and the fibers, although longer than 5μ, can no longer be seen. This occurs in the diameter range of 0.25-0.5μ.

The limit is not a sharp line but a "grey" area which varies with such things as the microscope optics, the skill of the operator, the care which the operator takes in setting up and adjusting the equipment, the visual acuity of the operator, the physical condition of the operator, the quality of the filter paper and the condition of the clearing solution used to prepare the slide. The limit can differ from day to day with the same operator using the same equipment. It has also been our experience in working with ultra-fine fibers that they are very easy to miss completely unless the operator specifically looks for such material.

PROCEDURE

It is the practice at the Niagara Falls laboratory to retain the unused portion of all filters collected. Filters were found to be still available for 36 locations where RG-244 counts had been made in the 1973-1977 time period.

PROCEDURE (Cont'd.)

In order to keep the counting load at a reasonable level only part of the available filters were recounted. Accordingly, several filters which were expected to represent the highest levels were selected to represent each location. These were mounted and recounted by our most active operator with great care and with careful searching for ultra-fine particles. A total of 65 filters were counted.

PRESENTATION AND DISCUSSION OF RESULTS

The results are summarized in Table IV. The data are listed chronologically by year with each location assigned a number to facilitate identification. The original count (Column y), the new count (Column x), and the difference, x-y, are shown for each filter.

The Occurrence of Fine Fibers

The recent recounts where ultra-fine fibers were the object of specific attention are obviously the best data to examine for the historical occurrence of such fibers. These counts, in fiber/cc, are shown graphically in chronological order in Figure 1. Where ultra-fine fibers were seen, the bars are dark. Where none were found, the bars are light. Note also in the figure that a split vertical scale has been used wherein the units for counts greater than 5 fibers/cc have been reduced by a factor of 10.

The occurrence of fine fibers is summarized in the table below:

Year	No. of Locations Recounted	Occurrence of Fine Fibers	
		No. of Locations	% of Locations
1973	2	0	0
1974	2	0	0
1975	11	5	45
1976	10	3	30
1977	11	5	45

During the two-and-a-half year period of 1973, 1974 and through March of 1975 only one flocculated bunch of fines was found on one filter. For the remainder of 1975, 1976, and 1977 fines occurred sporadically at 30-45% of the locations tested. If the fines had been present prior to March 1975 at the same frequency observed later, two or three occurrences would have been expected at these eight locations. This suggests that measurable quantities of very fine fibers occurred rarely, if at all, before 1975. They have clearly been present with considerable frequency since that time.

The quantity of fines present, particularly with regard to the potential to give occupational exposures above the present OSHA ceiling limit of 10 fibers/cc also shows a distinct pattern. In the two-and-a-half year period from 1975 to mid-1977 there was only one count above 10 fibers/cc, i.e., 1975 - No. 5 which was just above at 11.3 fibers/cc. The highest counts in this time span were generally in the range of 2-3 fibers/cc. In the second half of 1977, however, three counts ranging from 18 to 40 fibers/cc were obtained. (Note scale change in the

figure.) One of these (1977 - No. 11) verified an OSHA inspection count of around 25 fibers/cc obtained at the same location a month earlier.

Examination of these three very high results in detail shows that in one case (1977 - No. 6) substantial quantities of Nytal talc were used at the same time as the RG-244. This talc generates extremely fine fibers which cannot be distinguished optically from chrysotile asbestos. It is thus not possible to determine the relative contributions of each to the total count so this result cannot be given much weight in the present assessment.

In the second location (1977 - No. 8) a "homemade" dust control setup was in use. Air from over the mix tank was sucked through a flexible duct by an exhaust fan, passed through a filter, and discharged into a second room. The result shows the presence of substantial quantities of fines in the asbestos being dumped but is not directly correlatable with worker exposure in the breathing zone.

The third high count occurred in two samples from 1977, Location No. 11. Both of these took place while an operator was dumping bags, folding them, and inserting them into a metal drum. When the bag entered the drum, a blowback of air resulted. A repeated test several hours later which differed in that the operator tossed the empty bags on a pallet which was subsequently removed by a forklift, gave much lower counts in the 1-2 fiber/cc range. As noted previously, however, OSHA had reported a high count at this location earlier.

In summary, there have been two confirmed occurrences of high exposure, ~20-30 fibers/cc, one of potential high exposure, and one of possible but not definite high exposure due to ultra-fine fibers in RG-244 in a six-month period in the second half of 1977. Although these high levels clearly relate to the way the asbestos was handled, it is equally important to note that over the four-and-a-half years prior to that, only one case barely above 10 fibers/cc had been identified. Some of these 30 earlier locations tested should have shown very high counts if the potential for such levels was present in the material being handled. The product being used by customers in the latter half of 1977 was occasionally different from that produced in the past.

The pattern just described appears to correlate with certain plant operations. In the spring of 1975 the expanded circuit was started up. Increased throughput in the dryer would give higher percentages of fine fibers in the product and correspondly such fibers would be found in airborne dust samples.

In the spring of 1977 the production rate of RG-244 was again increased substantially and campaigning through the dryer was practiced frequently. It seems likely that there were intervals where a number of bags of product contained a sharply increased amount of fines. This would result in a high potential for airborne dust generation, particularly if the bag was handled carelessly in any way.

Considering the experimental results together with the knowledge of the RG-244 circuit operations, the following picture of the historical occurrence of fine fibers in the product can be drawn:

1. Until the spring of 1975 fine fibers were present at extremely rare intervals, if at all.

2. Following the plant expansion completed in the spring of 1975, measurable amounts of fines were present in the airborne dust at 30-50% of the users' locations.

3. Until mid-1975 the amount of fines present was small enough so that ceiling exposures were generally still in the 1-3 fiber/cc range.

4. During 1977, probably in the second and/or third quarters, RG-244 was produced occasionally that contained much higher levels of fines than in previous years. Fiber counts of 20-40 fibers/cc could be produced under conditions encountered commercially with these materials.

The extent of the fines problem in 1978 operations remains an open question. The plant continues to run at a high throughput. The only user test carried out was in February and the highest count obtained was an encouraging 0.1 fiber/cc.

No laboratory test of relative dustiness is available. The possibility of developing such a test was considered and dropped when it became evident that it would be a major project to work out the test and obtain the correlation with actual field use conditions that would be necessary. A continuing monitoring of regular samples from the RG-244 bagger operation at the plant is in progress, however, and is being reported elsewhere.

The Impact of Fine Fibers in Prior Dust Counts

The emperical precision of the optical counting method used in this work is the subject of continuing debate. Differences of 50-100% between replicate counts on the same filter are quite common and larger variations can occur as the quantity of fiber on the filter becomes smaller. It is well beyond the scope of this study to analyze these results in a general way. Only the specific effects on the samples where fine fibers were found in the second count will be examined.

Figure 2 is a repeat of Figure 1 with the original count results for the filters containing fine fibers indicated by the solid horizontal lines. Out of 19 filters containing fines there are only two where large changes occurred. These were 1975 - No. 5 from 1.3 to 11.2 fibers/cc and 1977 - No. 8 from 0.5 to 17.92 fibers/cc. There is no doubt that the fines were missed in the initial counts on these two filters.

The Impact of Fine Fibers in Prior Dust Counts (Cont'd.)

The other three high counts from 1977 show variations between replicates which are well within the recognized precision of the method. The next highest results ranged from 2-3 fibers/cc and occurred at four locations in 1975 and 1976, i.e., 1975 - Nos. 4 and 8 and 1976 - Nos. 3 and 6. These have a consistent bias of plus 2-3 fibers/cc. Since differences are all in the same direction, they are probably statistically significant but are also of limited practical importance since the results are far below the allowable OSHA ceiling limit. Overall, then, only two out of the 65 filters counted showed important errors due to the failure to "see" the ultra-fine fibers. Considering the extremely difficult nature of these samples, this is considered to be very good counter performance but continued special attention to RG-244 samples is needed and will be provided. The sudden appearance of occasional very high counts in 1977 was the result of a change in the product not a change in counting skills or equipment.

H. B. Rhodes

Harrison B. Rhodes

HBR/rmm
Attachments

AIRBORNE ASBESTOS FIBER COUNTS[1] -

"LARGE-SCALE" DUMPING OF RG-244 (~100-450 lb./Batch)

Plant	Data Reference	Description of Operation			Special Ventilation[2]	CEILING Concentration Fiber Count (Fibers/cc. >5μ)
		Bags Dumped	Dump Time (Min.)	Sample Time (Min.)		
A	---	10	10	10	None	0.7
B	1929-46-2	14	9	9	None	1.2
C	1929-30-2	15	21	21	Hood over thin tank opening	0.7
D	1929-56-1	36	12	12	None	2.4
E	1929-50-3	15	8	8	None	0.5
F	1929-26-3	45	20	20	None	1.6
G	1929-24-2	10	24	24	Hood over mixing area	0.8
H	1929-16-1	28	15	15	None	2.8
I	2119-8-9	13	8	8	None	0.4
J	2119-6-23	20	10	10	None	0.4
K	2119-12-9	34	72	72	None	0.9

[1] All samples collected in the breathing zone of the operator dumping the RG-244.

[2] Special ventilation refers to dust collection equipment at or near the dumping area that is specifically intended for dust control during the dumping operation. All plants had varying measures of overall building ventilation.

TABLE II

AIRBORNE ASBESTOS FIBER COUNTS -

EMPTY BAG REMOVAL

Plant	Data Reference	Description of Operation	Sample Time (Min.)	Fiber Count (Fibers/cc. >5μ)
A	---	Sample taken 3 feet above waste disposal drum for empty bags. (During dumping.)	10	0.4
B	1929-40-3	Directly over empty bag stacking area. Taken during dump.	23	0.6
B	1929-40-5	Empty bag storage area. Taken during dump as bags were put in.	24	0.4
J	2119-6-23	Sample taken during bag disposal and clean up.	24	0.1

TABLE III

AIRBORNE ASBESTOS FIBER COUNTS[1] - "SMALL-SCALE" DUMPING OF RG-244 (1-25 lbs./Batch)

End Use	Pounds Dumped	Dump Time (Min.)	Sample Time (Min.)	Special Ventilation[2]	Ceiling Concentration Fiber Count (Fibers/cc >5μ)
Furniture Molding	1	10	10	None	1.5
" "	12	2.5	2.5	None	1.1
" "	1	11	11	None	2.0
" "	6	8	8	Good Hood	0.9
Gel Coat Mfg.	9	25	25	None	0.7
" " "	3	3	3	None	1.2
Artificial Brick Mfg.	5	4	4		0.9
" " "	1.5	10	10	Good Hood	0.4
Roof Coating Mfg.	12	13	13	None	1.1
Gel Coat	10.5	13	13	None	0.3
Polyester	25	11	11	Outdoors	0.1
Epoxy	6.3	41	41	None	1.0
"	6.3	39	39	None	2.0
Gel Coat	20	10	10	None	0.6*
Putty	20	35	35	Exhaust Fan	2.1
"	20	34	34	Exhaust Fan	0.2
Sealant	15	19	19	None	0.2
Caulking Compound	6	3	3	None	0.5
" "	6	11	11	None	0.2
Patching Compound	3.3	10	10	None	0.7

[1] All samples collected in the breathing zone of the operator dumping the RG-244.

[2] Special ventilation refers to dust collection equipment at or near the dumping area that is specifically intended for dust control during the dumping operation. All plants had varying measures of overall building ventilation.

* Sample taken during dump and bag disposal.

TABLE IV

SUMMARY

RG-244 AIRBORNE FIBER COUNTS

Year	Loc. No.	Company	Loc.	Date Monitored	Sample No.	Operation Description	Original Count (y) Fibers per cc	Date Recounted	Recount (x) Fibers per cc	Comments	Difference Between Counts (x-y)
1973	1	Hughes Chemical	MI	8-20-73	Z-245	P - During use of RG-244.	1.0	4-10-78	0.2**	Fine particulate.	-0.8
	2	Kristal Kraft	FL	8-24-73	5	P - Dump 9 pounds.	0.7	5-3-78	0.6	No fine fibers.	-0.1
1974	1	Tuff Kote	MI	4-30-74	C-834	P - Dump 25 pounds.	0.3	5-3-78	1.2	Fine particulate, poor background.	+0.9
	2	Kinetics Inc.	NM	8-13-74	1-13	P - Shaping pipe.	0.3	5-2-78	0.6	No fine fibers.	+0.3
1975	1	Bridgeport Chemical	FL	2-2-75	L-10	P - Handling asbestos.	0.2	4-6-78	0.2	One very fine bundle.	0
	2	Glassflake Corp.	FL	2-18-75	N-19	P - Dump 7 pounds.	0	4-10-78	0.2	No fine fibers	+0.2
	3	Cargill Company	CA	2-19-75	Q-39	P - Dump 15 bags.	1.3	4-6-78	0.4**	No fine fibers.	-0.9
		Cargill Company	CA	2-19-75	Q-36	P - Empty bag removal.	1.3	4-6-78	0.4**	No fine fibers.	-0.9
	4	Alpha Chemical	FL	5-7-75	A-21	P - Handling empty bags.	0.7	4-5-78	2.1*	Poor resolution, several planes. Fine fibers.	+1.4
		Alpha Chemical	FL	5-7-75	A-64	P - Dump 8 bags.	0.4	4-5-78	0.4	Poor resolution, several planes.	0
	5	Steadfast Rubber	MA	5-20-75	A-81	P - Weigh & dump 10 pounds.	1.3	5-5-78	11.2*	Some very fine fibers.	+9.9
	6	Acme Fiberglass Co.	CA	6-13-75	A-77	P - Grinding fiberglass tubes.	2.1	4-5-78	5.1	Poor resolution.	+3
	7	International Paint Co.	NJ	8-13-75	B-82	P - Dump 8 bags into Cowles.	1.24	4-10-78	1.6	No fine fibers	+0.36
		International Paint Co.	NJ	8-13-75	B-71	P - Dump RG-244, bag disposal.	0.65	4-10-78	0.6	No fine fibers.	-0.05
	8	Interplastic Corp.	MN	9-5-75	B-33	P - Dump 28 bags.	1.0	5-1-78	2.3*	Some very fine fibers.	+1.3
		Interplastic Corp.	MN	9-5-75	B-18	P - After dump.	0.2	5-1-78	0.1	No fine fibers.	-0.1
	9	Interplastic Corp.	OH	9-18-75	B-49	P - After dump.	0.3	4-10-78	0.3	Poor resolution - several planes.	0
	10	Glove Coaters	MI	9-26-75	B-29	P - 90 pounds RG-244 to mixer.	5.3	4-10-78	1.9	Clear background.	-3.4
		Glove Coaters	MI	9-26-75	C-81	A - During and after RG-244 dump 15' from mixer, 5' above floor.	0.3	4-10-78	0.3	Fine particulate, some very fine fibers in areas not containing fine particulate.	0
	11	General Tire	OH	12-10-75	D-25	P - Dump 10 pounds.	0.3	4-10-78	0.3	No fine fibers.	0
1976	1	Alpha Chemical	CA	1-19-76	D-34	P - Dump 2-1/2 bags.	0.1	4-5-78	0.2	One extremely fine bundle.	+0.1
	2	A-Z	FL	3-3-76	D-76	P - Dump 13 bags.	0.3	4-5-78	0.17	No fine fibers.	+0.4
		A-Z	FL	3-3-76	C-97	A - 13 bags dumped.	0.4	4-5-78	0.5	No fine fibers.	+0.1
	3	Freeman Chemical	WI	3-25-76	D-98	P - Dump 20 pounds.	0.6	5-1-78	2.8*	Some very fine fibers.	+2.2
		Freeman Chemical	WI	3-25-76	D-45	P - After dump.	0.7	5-1-78	0.5	Some fine fibers (not as many as D-98).	-0.2
	4	Apperson	FL	3-29-76	D-75	A - Unloading pallets.	0.1	4-5-78	0.1	No fine fibers.	0
		Apperson	FL	3-29-76	D-84	P - Forklift operator.	<0.1	5-1-78	<0.1	No fine fibers.	0
		Apperson	FL	4-1-76	D-6	A - Unloading pallets.	1.0	4-6-78	0.04**	No fine fibers.	-1.0
	5	U.S. Plastic & Chemical Corp.	NY	7-29-76	F-36	A - Weighing 3 pounds.	0.8	5-5-78	0.3	No fine fibers.	-0.5
	6	Solvean Laboratories	CA	8-3-76	1	P - Weigh & dump 340 lbs.	0.9	5-5-78	2.04*	Some very fine fibers - difficult to count.	+1.14
	7	Tohoku Plastic Engineering	Japan	9-8-76	1	P - Dump 1.5 kg RG-244. (Nytal 300 talc also dumped.)	0.7	5-3-78	1.3	No fine fibers.	+0.6
	8	Interplastic Corporation	OK	10-12-76	F-43	A - During dump.	0.2	5-3-78	0.3	No fine fibers.	+0.1
		Interplastic Corporation	OK	10-12-76	G-38	P - Dump 30 pounds.	0.5	5-3-78	1.3	Poor background - granular looking.	0.8
	9	Red Devil Inc.	OK	10-12-76	F-33	P - Weigh & dump 6 pounds.	<0.1	5-5-78	0.9*	No fine fibers.	0.8
	10	Metro Warehouse	MO	11-22-76	E-76	P - Forklift	0.2	5-2-78	0.6	No fine fibers.	+0.4
		Metro Warehouse	MO	11-22-76	G-24	P - Forklift	0.2	5-2-78	0.1	No fine fibers.	-0.1
		Metro Warehouse	MO	11-22-76	F-69	P - Forklift	0.5	5-2-78	0.7	No fine fibers.	+0.2

A - Area

P - Personal

* Higher than original.

** Lower than original.

Year	Loc. No.	Company	Loc.	Date Monitored	Sample No.	Operation Description	Original Count (y) Fibers per cc	Recounted	Recount (x) Fibers per cc	Comments	Difference Between Counts (x-y)
1977	1	Norton Company	NJ	2-16-77	R-38	P - Dump 15 pounds.	0.2	5-2-78	0.4	No fine fibers.	+0.2
	2	Coatings & Plastic	AR	3-2-77	A-20	P - Weighing 1.6 pounds and dump.	0.2	4-6-78	0.9	Some fine fibers.	+0.7
	3	Adcoat Inc.	CA	3-30-77	B-39	P - Dump 48 lbs.-outdoors.	0.1	4-5-78	0.4	No fine fibers.	+0.3
		Adcoat Inc.	CA	3-30-77	B-38	A - After use of RG-244.	0.1	4-5-78	0.1	No fine fibers.	0
	4	Carboline Company	OH	4-5&6-77	K-4	P - Dump 50 pounds.	0.8	5-1-78	1.03	Fine fibers	+0.23
		Carboline Company	OH	4-5&6-77	M-5	P - After 50 pound dump.	0.16	5-1-78	0.1	Fine particulate	-0.06
		Carboline Company	OH	4-5&6-77	K-36	P - Dump 179 pounds.	0.2	5-1-78	0.3	Fine fibers, several planes.	+0.1
		Carboline Company	OH	4-5&6-77	A-88	P - Normal duties.	0.01	5-1-78	0.1	Chunky & fine particulate.	+0.09
		Carboline Company	OH	4-5&6-77	R-31	P - After 179 pound dump.	0.4	5-1-78	0.8	No fine fibers.	+0.4
		Carboline Company	OH	4-5&6-77	K-46	P - Weighing 179 pounds.	0.13	5-2-78	0.3	Chunky & fine particulate.	+0.17
		Carboline Company	OH	4-5&6-77	K-33	P - Weighing 50 pounds RG-244.	0.18	5-1-78	0.7	Chunky particulate.	+0.52
	5	Chemex	FL	5-10-77	A-50	P - Dump 2 bags and bag disposal.	0.28	4-6-78	1.5*	Poor resolution, several planes.	+1.22
	6	Tnemec Inc.	MO	5-16-77 & 6-22-77	N-35	P - Dump 60 pounds.	28.5	5-5-78	39.8	Some extremely fine fibers, poor background due to particulate, several planes. Nytal 300 talc used during monitoring.	+11.3
	7	Products Research and Chemical Corporation	CA	6-30-77	B-35	P - Dump 70 pounds.	0.1	5-2-78	0.2	No fine fibers	+0.1
	8	Dayton Chem. & Coat.	OH	7-14-77	N-99	A - In outlet of exhaust through which filtered air was recirculated.	0.5	4-6-78	17.92	Extremely fine fibers - very difficult to count - took 50 minutes to count only 50 fields.	+17.42
		(Re-checks by B. L. Ingalls on 4-28-78)					(@ 400X) (@ 1000X)		8.8 20.9		
		Dayton Chem & Coat.	OH	7-14-77	N-98	P - Dump 20 pounds.	0.3	4-6-78	0.7	No fine fibers.	+0.4
	9	International Paint	CA	8-3-77	B-43	P - Dump 40 pounds.	0	4-10-78	0.54*	No fine fibers.	+0.54
	10	Southern Imperial Coatings	LA	9-12-77	D-78	P - Dump 52 pounds.	8.6	5-5-78	12.7*	Heavily loaded with small and chunky particulate.	+4.1
	11	Carboline Company	CA	12-13-77	C-43	P - 220 pound dump.	44.5	5-2-78	27.8**	Fine fibers.	-16.7
		Carboline Company	CA	12-13-77	C-40	P - 220 pound dump.	31.5	5-2-78	22.4**	Fine fibers.	-9.1
		Carboline Company	CA	12-13-77	C-36	P - Bag disposal.	0.5	5-2-78	0.8	No fine fibers.	+0.3
		Carboline Company	CA	12-13-77	C-31	P - After dump.	0.4	5-2-78	0.4	No fine fibers.	0
		Carboline Company	CA	12-13-77	C-37	P - Dump 220 pounds.	1.4	5-2-78	0.94	No fine fibers.	-0.46
		Carboline Company	CA	12-13-77	M-45	P - Dump 220 pounds.	0.4	5-2-78	0.4	No fine fibers.	0
		Carboline Company	CA	12-13-77	A-41	P - Bag disposal.	0.3	5-2-78	0.7	No fine fibers.	+0.4
		Carboline Company	CA	12-13-77	A-42	P - Bag disposal.	5.8	5-2-78	1.4**	Poor distribution observed on first count.	-4.4
		Carboline Company	CA	12-13-77	C-39	P - Bag disposal	1.7	5-1-78	0.9**	Poor distribution	-0.8
		Carboline Company	CA	12-13-77	M-59	P - Bag disposal	0.4	5-2-78	0.4	No fine fibers.	0

A - Area

P - Personal

*Higher than original.

**Lower than original.

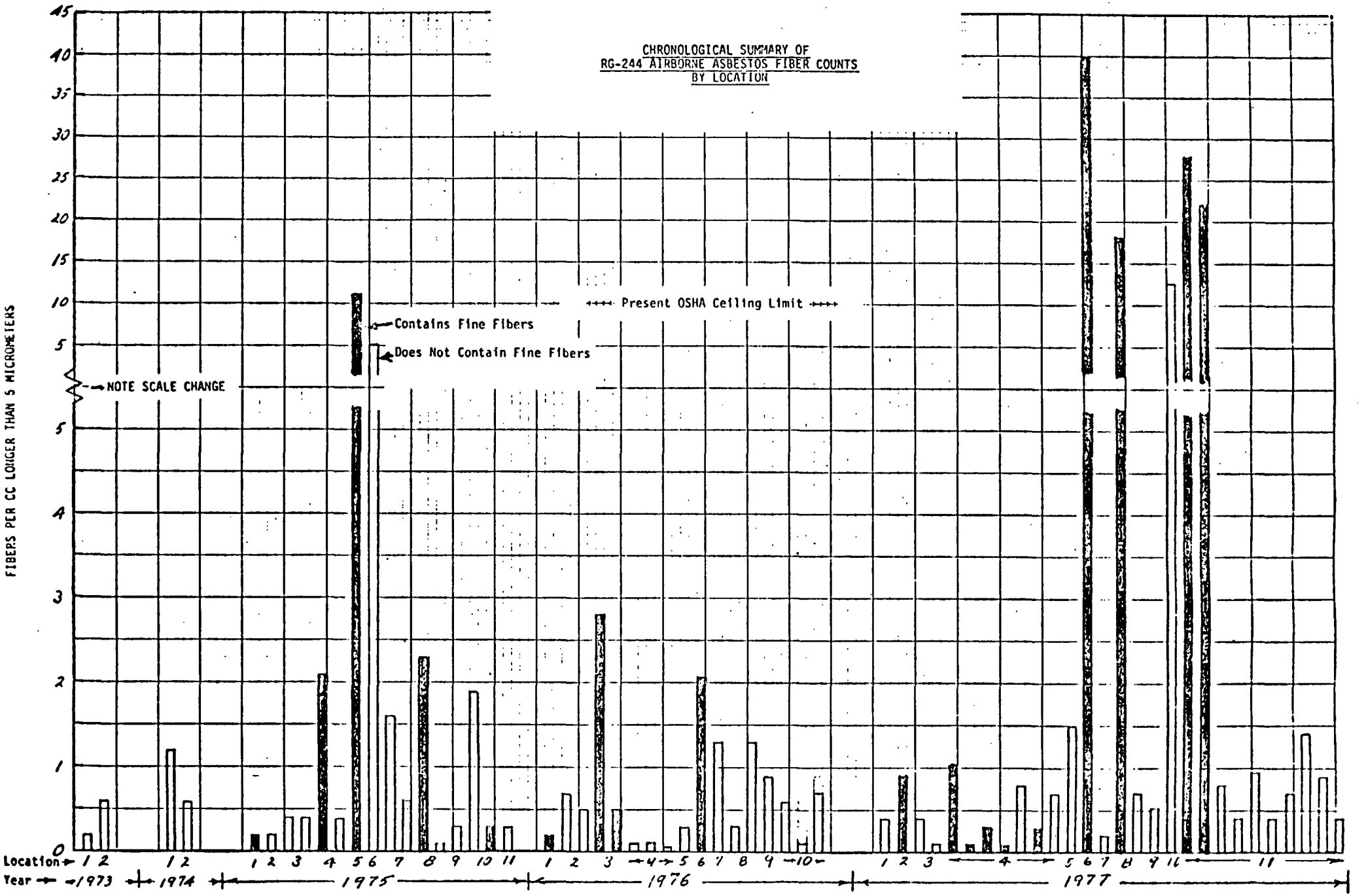
CHRONOLOGICAL SUMMARY OF
RG-244 AIRBORNE ASBESTOS FIBER COUNTS
BY LOCATION
FIBERS PER CC LONGER THAN 5 MICROMETERS
45
40
35
30
25
20
15
10
5
0
Present OSHA Ceiling Limit
Contains Fine Fibers
Does Not Contain Fine Fibers
NOTE SCALE CHANGE
Location
Year
1973
1974
1975
1976
1977

FIGURE 1

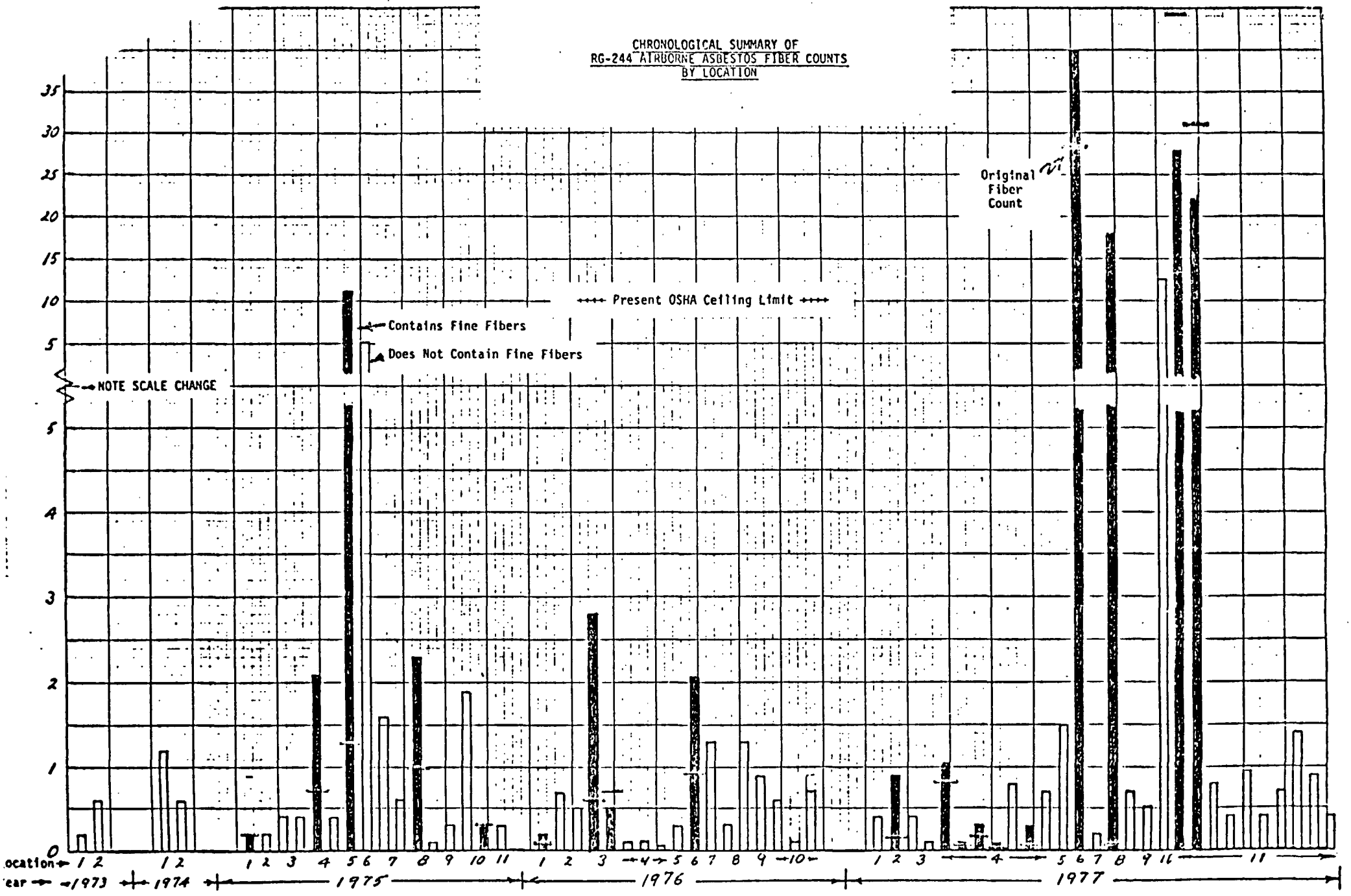
CHRONOLOGICAL SUMMARY OF
RG-244 AIRBORNE ASBESTOS FIBER COUNTS
BY LOCATION
35
30
25
20
15
10
5
5
4
3
2
1
0
Original Fiber Count
Present OSHA Ceiling Limit
Contains Fine Fibers
Does Not Contain Fine Fibers
NOTE SCALE CHANGE
Location
Year
1973
1974
1975
1976
1977

FIGURE 2

cc: via telecopier to R W Rebholz

Ceilcote

AUG 24 1979

August 22, 1979

Mr. A. C. MacLeod, President
Union Carbide Corporation
Chemicals and Plastics Division
270 Park Avenue
New York, New York 10017

Dear Mr. MacLeod,

Thank you for your help. It is most sincerely appreciated.

Mr. John L. Myers, Marketing Manager for Union Carbide's Metals Division, accompanied by Gordan Dickson of Union Carbide and Ray Groya and Richard Kelly of Technical Products Inc., called on us this morning. They have completely answered our immediately disturbing concerns, and will be cooperating with us further to establish the entire matter on a firm and fully acceptable foundation.

It is clear that both Union Carbide and Ceilcote share "honors" for allowing this awkwardness to develop. We apparently have been talking to the wrong people on this matter and should have recognized this. And your people should have realized the need to have us directed to others.

So be it. The favorable result for us is that we will have adequate data to assure safe use of Union Carbide's R-G 244 Calidria Asbestos and be able to convince our employees of that fact. The favorable result for Union Carbide is you have demonstrated again the integrity of being a responsive, responsible supplier offering the important undergirding a Company such as we must have. And more, it appears you may have another product we might use.

If we have caused any uncomfortableness among your people, please let them know the event has strengthened our relationship in a fine way.

THE CEILCOTE COMPANY / A UNIT OF GENERAL DIGITAL
[illegible] / BEREA, OHIO [illegible] / PHONE: [illegible] / TELEX: [illegible]

Again, thank you for your help. Compliments to your staff.

Sincerely,

Walter M Huber

Walter M. Huber
Facilities Manager

WMH:jc

Copies: John L. Myers
Gordam L. Dickson

Union Carbide Corporation
Metals Division
Post Office Box 579
Niagara Falls, New York 14302

Ray Groya ✓
Richard J. Kelly

Technical Products Inc.
3500 Ridge Road
Cleveland, Ohio 44102

J. G. Galloway
William Sims
William Wright