PLAINTIFF'S EXHIBIT

UC-4486

AIRBORNE DUST COUNTS

for

Conwed Corporation
Cloquet, Minnesota

August 28, 1972

Personnel Present: E. J. Kleber
Customer Service Representative
Union Carbide Corporation

T. P. Norris
Midwest Region Sales Manager
Union Carbide Corporation

E. McGuillvary
Environmental Control
Conwed Corporation

UNION CARBIDE CORPORATION
Mining and Metals Division
Niagara Falls, New York

X416888

The results of microscope counts for air samples collected at Conwed Corporation, Cloquet, Minnesota, August 9th and 10th, 1972 are attached.

Apparatus & Procedure

Sampling and dust counting were carried out in accordance with OSHA Regulation 1910.93a.

Unico Personal Air Samplers, calibrated to 2 liters per minute, were used to collect personal breathing zone and environmental samples on Millipore membrane filters of 0.8 micron porosity.

Fiber counting was performed on a Leitz microscope utilizing phase contrast illumination at 400X and a Patterson Globe and Circle reticle.

Total dust was determined by light field microscopy at 100X.

Test Results

Three figures have been reported for each sample. They are:

1) Total Fiber - Any material 5 microns or longer having an aspect ratio of 3 or greater. Reported as fibers per milliliter.

2) Asbestos Fiber - Any material, 5 microns or longer, having an aspect ratio of 3 or greater, which in the judgement of the operator could possibly be asbestos. Reported as fibers per milliliter.

3) Total Dust - Any fiber or particle present. Reported as million particles per cubic foot.

Enclosed for reference is a copy of the OSHA Standard for exposure to asbestos dust, which includes silica and inert dust limits.

X416889

SUMMARY OF DUST COUNTS

N.B. No.	Description	Asbestos Fiber Count Fibers/ml > 5μ	Total Fiber Count Fibers/ml > 5μ	Total Dust mmppcf
	BOARD & PULP MILL			
1929-2-1	Personal (7.67 min.) - Bulk fiber bagger - operator	0	0	0.16
1929-2-2	Environmental (114 min.) - No. 3 board machine run-out section- 4' from end of conveyor dumping mineral wool into stock chest	0.15	1.01	0.55
1929-2-3	Environmental (132 min.) - Mineral slurry hydropulper tub - eye level above tub 2 bags asbestos dumped every 20 minutes (HP Pellets)	0.19	1.40	1.02
1929-2-4	Personal (2.08 min.) - Same as #3, during dumping	1.03	2.06	0.85
	COATING MAKE-UP AREA			
1929-2-5	Environmental (145 min.) - Coating make-up deck between #35 mix tank and separan tank	0	0	2.85
1929-2-6	Personal (9.33 min.) - Coating make-up deck on coating make-up man as batch of #31 coating is prepared	0	0	31.38
	FINISHING DEPARTMENT			
929-2-7	Environmental (43 min.) - No. 3 trimmer - operator's desk	0.20	0.40	1.09
929-2-8	Environmental (46 min.) - No. 4 trimmer - 9' off floor on catwalk by 2nd arbor	0.28	1.68	0.58
929-2-9	Environmental (115 min.) - Between #1 and #3 board dryers - by W. broke hydropulper 6' off floor	0.15	0.60	0.53
1292-2-10	Environmental (194 min.) - No. 3 dry end coating line - slitter area - south side - 6' off floor	0.09	0.64	0.51
1292-2-11	Environmental (138 min.) - No. 3 dry end coating line - station B. East grading station - 6' off floor	0.16	0.50	0.43
	TUFFLEX DEPARTMENT			
1929-2-12	Environmental (75 min.) - No. 2 Tufflex line - shredder area eye level mount between cotton linter feeder and E. Shredder [10 min. blow-down with 3 air hoses during sampling]	0	0.17	1.20

X416890

N.B. No.	Description	Asbestos Fiber Count Fibers/ml > 5μ	Total Fiber Count Fibers/ml > 5μ	Total Dust mmppct
1929-2-13	Personal (9.75 min.) - No. 2 Tufflex machine - transfer section on backtender's helper	0.88	1.76	2.68
	CONWED FABRICS DEPARTMENT			
1929-2-14	Personal (7.0 min.) - Conwed Farbics fiber preparation room - operator feeding cotton linters into P&S feeders	0	5.51	2.35
	LO-TONE DEPARTMENT			
1929-2-15	Environmental (104 min.) - Lo-Tone #4 - line grinder area 6' off floor	0.16	1.44	0.76

X416891

Calidria ASBESTOS

UNION CARBIDE

THE DISCOVERY COMPANY

UNION CARBIDE CORPORATION • MINING & METALS DIVISION • P.O. BOX 579 • NIAGARA FALLS, N.Y. 14302 • TEL: 716-285-3311

RECEIVED
SEP 2[illegible] 19[illegible]
UCC-CALIDRIA
[illegible], N.Y.

September 1, 1972

Conwed Corporation
Cloquet, Minnesota 55720

Dear Sir:

We would like to have your permission to use the information obtained in the course of the tests conducted at your facility and to furnish it to other parties without identifying your facility as the location at which measurements were taken. The tests shall consist of taking measurements by the membrane filter method of airborne asbestos fiber generated in the course of one or more phases of your manufacturing operations.

If you agree to the foregoing, please so indicate by signing and returning the enclosed copy of this letter. Such action on your part shall constitute authorization to take such measurements at your facility and to use and disclose said information as detailed in this letter.

Very truly yours,

E. J. Kleber
Customer Service Representative

Accepted and Agreed to

this 30 day of

September, 1972

Director of Manufacturing-Cloquet

X416892

COUNT SHEET

Sample #	20	48	13	31	27	23	Y	3
time								
Flow								
1	463	19	511	187	1746	520	400	270
2	574	6	480	247	2034	360	210	282
3	673	9	703	141	2073	380	351	470
4	525	9	601	183	2141			
5	472	11	578	184	2027			
6		15		141				
7		11		193				
8		8		180				
9		8		143				
10		7		190				
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
TOTAL	2707	85	3073	1789	10,021	1260	1510	1022
							320	
AVG	541.4	8.5	614.6	178.9	2004.2	420	453	340.6
Field Area	.0998							
Filter Area	855							
Volume	6.1044	.4502	4.403	.5723	.5476	6.75	252	6.691
Concentration	0.76	0.16	1.20	2.68	31.38	0.53	1.49	0.55

Final Cnt x Filter Area / Field Area x Sample Vol. Ml

X 416893 X

CONWED CORP
DUST SAMPLING 8/31-10/72
By UNION CARBIDE's EDKLESER
Tom Hoke's
(CONWED-ESMIL)

No.	F./Hr./cc.	Type	Description
1 ✓	48	P.S.	Bulk Fiber Bagger - operator
Board & Pulp Mill			
2 ✓	3	E.S.	No. 3 Board Mach. Run out Section (4' from end of Conveyor dumping mineral wool into stock chest)
3 ✓	26	E.S.	Mineral Slurry Hydropulper Tub (Eye level above Tub)
4	35	P.S.	Slurry Hydropulper operator (same as 26 above)
COATING MAKE UP			
5 ✓	14	E.S.	Coating Make-up deck - Between #35 mix tank and Separan tank
6	27	P.S.	Coating Make-up deck - on Coating make-up man as batch of #31 Ctg is prepared.
Finishing DEPT			
7	8	E.S.	No. 3 Trimmer Operators desk
8 ✓	43	E.S.	No. 4 " - 9' off floor on catwalk by 2nd Arbor
9	23	E.S.	Between #143 Board Dryers by W. Broke Hydropulper - 6' off floor
10	17	E.S.	No. 3 Dry end Coating line - Slitter Area - South Side - 6' off floor
11	21	E.S.	No. 3 Dry end Coating line - Station B E. grading station 6' off floor

X416894

No.	Filter No.	Type	Description
Tufflex Dept			
12	13	E.S.	No. 2 Tufflex line - Shredder Area eye level mount between Cotton linter feeder & E. Shredder (10 min. blowdown with 3 air hoses during sampling
13	31	P.S.	No. 2 Tufflex Mach. - Transfer section on backtender helper's belt
Conrad Fabrics Dept			
14	28	P.S.	Conrad Fabrics Fiber Prep. room operator feeding Cotton linters into P & S feeders
Co-Tone Dept			
5-	20	E.S.	Co-Tone #4 Line Grinder Area 6' off floor

X416895

Land Bridge to
Hamburg approx
$100 cheaper
Figures forthcoming in
Letter
for
38,000 lbs. HDP
No 20's, must be
40 pt - $
L.B. 932 everything
W. Ct 1027

X416896

COUNT SHEET #41689

	1	72	207	3	1155	484	40	84	70
Sample #	48	3	26	35	14	27	8	43	23
time	7.67	114.0	132.0	2.08	145.0	9.33	43.0	46	115
flow	1.6635								
1	8	23	193	3	1134	1152	72	147	129
2	1	111	201	13	496	826	22	188	131
3	2	118	71	4	97	923	8	71	92
4	2	147	77	9	197	3	74	158	119
5	2	87	273	12	1233	1012	73	6	94
6	2	117	506	4			110	3	237
7	3	112	495	8			86	2	154
8	9	135	498	12			23	171	202
9	9	115	271	6			59	187	147
10	1	94	256	3			113	207	161
11	5								
12	2								
13	20								
14	2								
15	1								
16	2								
17	1								
18	25								
19	2								
20	2								
TOTAL	115	1149	4881	74	COLT	4816	885	1884	1630
AVG	5.75	114.9	488.1	7.4	1213.4	963.2	88.5	188.4	163
FIELD AREA									
FILTER AREA									
VOLUME									
CONCENTRATION	0.11	0.14	0.52	0.50	1.28	14.52	0.29	~~0.46~~ 0.58	0.2
FIBER CNT X FILTER AREA / FIELD AREA X SAMPLE VOLUME									
	1	2	3	4	5	6	7	8	9

COUNT Sheet

Sample #	20 Fib/Asb	20 Dust	28 Fib	28 Dust	14 Dust ~~Asb~~	14 Fib	17 Dust	17 Asb	3 Dust
time		104		7	145		199		
flow									
1	2/1	258	1	82	1155	0	926	0	120
2	0	264	0	83	1384	10	328	1	72
3	4/0	245	1	124	1009	1	513	0	145
4	3/0	236	0	72	1097	0	451	0	
5	1/0	254	0	107	1130	1	423	0	1123
6	1/0	247	1	67		5	372	1	
7	3/1	1698	1	114		1	323	0	
8	0	208	0	109		0	343	0	
9	4/1	248	1	98		0	411	0	
10	1/0	315	0	74		2	507	0	
11	2/0		1			1		0	
12	0		1			2		0	
13	1/1		1			0		0	
14	0		0			0		0	
15	1/0		0			1		1	
16	2/0		1			3		1	
17	3/0		0			1		0	
18	4/0		0			0		0	
19	2/0		0			1		0	
20	1/0		0			0		0	
TOTAL	35/4	2446	9	930	5777.	29	4097	4	
AVG	1.8/0.2	244.6	0.45	46.5	1155.4	1.45	409.7	0.2	

Field Area	.1034
Filter Area	~~.0855~~
Volume	~~.0855~~
Concentration	.935
Filter Cut x Filter Area / Field Area x Sample Vol	0.30

416899

COUNT SHEET

Sample #	20 Fib/Ass	20 Dust	er Fib	Dust	14 Dust Ass	17 Fib	17 Dust	17 Ass	3 Dust
time	104		7		145		199		
flow									
1	2/1	258	1	82	1155	0	426	0	120
2	0	264	0	83	1384	10	328	1	72
3	4/0	245	1	124	1009	1	513	0	145
4	3/0	236	0	72	1097	0	451	0	
5	1/0	254	0	107	1130	1	423	0	
6	1/0	247	1	67		5	372	1	112.3
7	3/1	169	1	114		1	323	0	
8	0	208	0	109		0	343	0	
9	2/1	248	1	98		0	411	0	
10	1/0	315	0	74		2	507	0	
11	2/0		1			1		0	
12	0		1			2		0	
13	1/1		1			0		0	
14	0		0			0		0	
15	1/0		0			1		1	
16	2/0		1			3		1	
17	3/0		0			1		0	
18	4/0		0			0		0	
19	2/0		0			1		0	
20	1/0		0			0		0	
TOTAL	35/4	2446	9	930	5777.	29	4097	4	
AVG	1.8/0.2	244.6	0.45	46.5	1155.4	1.45	409.7	0.2	

FIELD AREA	.1034
FILTER AREA	~~.0855~~ .0855
VOLUME	
CONCENTRATION	.935
FINAL CNT X FILTER AREA	0.20
FIELD AREA X SAMPLE VOL. ml	

M 16899

COUNT SHEET

Sample #	20 FIB/ASB	20 DUST	28 FIB	DUST	14 DUST ASB	11 FIB	17 DUST	17 ASB	3 DUST
time	104		7		145		199		
FLOW									
1	2/1	258	1	82	1155	0	426	0	120
2	0	264	0	83	1384	10	328	1	72
3	4/0	245	1	124	1009	1	513	0	145
4	3/0	236	0	72	1097	0	451	0	
5	1/0	254	0	107	1130	1	423	0	(1123)
6	1/0	247	1	67		5	372	1	
7	3/1	169	1	114		1	323	0	
8	0	208	0	109		0	343	0	
9	4/1	248	1	98		0	411	0	
10	1/0	315	0	74		2	507	0	
11	2/0		1			1		0	
12	0		1			2		0	
13	1/1		1			0		0	
14	0		0			0		0	
15	1/0		0			1		1	
16	2/0		1			3		1	
17	3/0		0			1		0	
18	4/0		0			0		0	
19	2/0		0			1		0	
20	1/0		0			0		0	
TOTAL	35/4	2446	9	930	5777	29	4097	4	
AVG	1.75/.2	244.6	0.45	46.5	1155.4	1.45	409.7	0.2	

FIELD AREA	.1034
FILTER AREA	~~.0855~~ 1.~~0855~~
VOLUME	
CONCENTRATION	.935
FINAL CUT X FILTER AREA	0.30
FIELD AREA X SAMPLE VOL	

M416899

COUNT SHEET

Sample #	3 flo	OUT	ASO
time		9.75	
FLOW			
1	0	29	0
2	1	22	1
3	1	45	0
4	0	47	1
5	0	35	1
6	0	47	0
7	0	42	1
8	1	81	1
9	0	50	0
10	0	82	0
11	0		0
12	0		0
13	0		0
14	0		0
15	0		0
16	0		0
17	0		0
18	1		0
19	0		0
20	0		0
			2
TOTAL	4	480	~~480~~
AVG	0.2	24.0	~~24.~~ 0.1

FIELD AREA

FILTER AREA

VOLUME

CONCENTRATION

FIBER CNT X FILTER AREA / FIELD AREA X SAMPLE VOL. ml

X416900

COUNT SHEET

Sample #	3 FIB.	3 DUST	3 ASB	26 FIB	26 DUST	26 ASB	35 FIB	35 DUST	35 ASB
Time	114 min →			132 →			208 →		
Flow 1.6635 ~~2.0~~	→			→			→		
1	0	112	0	2	172	0	0	0	0
2	1	69	0	4	188	1	0	1	0
3	1	83	0	0	193	0	0	1	0
4	0	54	0	2	131	0	0	6	0
5	3	~~7~~	0	0	182	0	0	2	0
6	0	38	0	5	240	1	0	4	0
7	2	~~3~~	0	1	243	0	0	4	0
8	0	56	1	3	276	0	0	5	0
9	3	65	0	1	213	0	0	4	0
10	1	93	1	2	242	0	0	10	0
11	1	80	0	2		0	0	4	0
12	2	67	0	2		0	0	1	0
13	0	76	0	5		0	0	6	0
14	1	78	0	4		2	0	4	0
15	1	55	0	5		0	0	4	0
16	3	34	1	3		1	1	0	0
17	1	76	0	2		0	0	0	0
18	3	64	0	1		0	0	1	0
19	1	60	1	1		0	0	3	0
20	3	76	0	3		1	0	1	0
TOTAL	27	1302	4	43	2085	6	1	61	0
AVG	1.35	72.33	0.2	2.15	209.5	0.3	0.05	3.05	0
FIELD AREA	.006	.1067	.006	.006	.1067	.006	.006	.1067	.006
FILTER AREA	855 →								
VOLUME	228l →			264l →			416l →		
	→	8.04 %			9.31			.1468	
CONCENTRATION	8.87 f/ml	.1072 f/ml	0.125 f/ml	1.1605 f/ml	.1799 f/ml	.1419 f/ml	.17 f/ml	.12 f/ml	0 f/ml
FIBER CNT X FILTER AREA									
FIELD AREA X SAMPLE VOL.									

Y416901

Field 1.5 (400X)

.115 X .053 @ 400

100 - 5u

100X

0.485 X 0.22

X416902

COUNT SHEET

	48	68	7	27	27	7
SAMPLE #	FC	FC	FC	FC	FC	FC
TIME	2.67	→	→	9:33		
FLOW	2l/m	→	→	→	→	→
1	0	0	-	0	238	0
2	-	1	-	0	323	0
3	0	2	0	1	324	0
4	-	2	-	0	326	-
5	-	0	-	-	326	-
6	-	0	-	-	326	-
7	-	0	0	0	449	-
8	-	0	-	0	450	-
9	-	1	0	-	456	0
10	0	1	0	0	469	0
11	0	1	0	0		0
12	0	0	0	0		0
13	0	1	0	-		0
14	0	0	0	-		0
15	0	1	-	0		0
16	-	0	-	0		0
17	0	2	0	0		0
18	0	2	0	0		0
19	0	1	0	0		0
20	0	0	0	0		0
TOTAL	0	15	0	0	465	0
AVG	0	0.75	0	0	486.5	0
FIELD AREA	.006	.1067	.006	.006	.1067	.006
FILTER AREA	855					
VOLUME	15.34	→	→	18.66	→	→
		0.5415			0.6586	
CONCENTRATION	0	.01	0	0	5.93	0
		MAPCT			MAPCT	

FIBER CNT × FILTER AREA
FIELD AREA × SAMPLE VOL ml

X416903

COUNT SHEET

Sample #	8 FID.	8 DUST	8 ASB	43 FID	43 DUST	43 ASB	23 FID	23 DUST	23 ASB
Time	43	43	43	46	46	46	115	115	115
Flow	2 l/m								
1	1	1	1	2	73	1	0	53	0
2	0	3	0	0	68	0	0	68	0
3	0	50	0	1	77	0	0	85	0
4	0	40	0	1	90	0	0	55	0
5	0	38	0	0	107	0	0	77	0
6	0	17	0	0	98	0	0	69	0
7	0	30	0	2	87	0	2	76	1
8	2	37	1	1	88	0	1	64	0
9	0	38	0	0	84	0	1	61	0
10	0	49	0	2	68	0	2	82	1
11	0	59	0	1		1	2		1
12	0	49	0	1		0	0		0
13	0		0	0		0	0		0
14	0		0	0		0	1		0
15	0		0	2		0	0		0
16	0		0	1		0	1		0
17	0		0	0		0	0		0
18	1		0	0		0	3		0
19	0		0	2		1	2		1
20	0		0	0		0	1		0
TOTAL	4	401	2	18	890	3	16	690	4
AVG	0.2	40.1	0.1	0.9	84	.15	.8	69	.2
FIELD AREA	.006	.067	.006	.006	.067	.006	.006	.067	.006
FILTER AREA	855								
VOLUME	8 l	8 l	8 l	92 l	92 l	92 l	23 l	2 l	23 l
		3.035			3.247			8.44	
CONCENTRATION	.331 f/l	.106 f/l	.17 f/l	1.39	.207	.2323	.4954	.068	.1239

FINAL CNT X FILTER AREA
FIELD AREA X Sample Vol. ml

X416904

COUNT SHEET

Sample #	21	21	21	13	13	13
	F10	DUST	ASB	F10	DUST	ASB
time	138	138	138	75	75	75
flow	2l/m					
1	0	273	0	0	141	0
2	0	152	0	0	221	0
3	2	159	1	1	289	0
4	0	178	0	0	195	0
5	0	226	0	0	173	0
6	0	263	0	0	126	0
7	0	159	0	0	223	0
8	1	121	1	0	156	0
9	0	173	0	0	237	0
10	2	103	0	0	146	0
11	0		0	0		0
12	0		0	0		0
13	1		1	0		0
14	0		0	0		0
15	1		1	0		0
16	1		0	1		0
17	1		0	0		0
18	0		0	0		0
19	3		1	1		0
20	4		0	0		0
TOTAL	16	1757	5	3	1947	0
AVG	~~.25~~ .8	175.7	.25	.15	194.7	0
FIELD AREA	.006	.1067	.006	.006	.1067	.006
FILTER AREA	855					
VOLUME	276l	276l	276l	150l	150l	150l
		9.74 ft³			5.295 ft³	
CONCENTRATION	.413	.145	.077	.1425	.294	0

FINAL CNT × FILTER AREA
FIELD AREA × SAMPLE VOL/ml

X116905

COUNT SHEET

Sample #	26	17	28	1	35	84	99	89?
time								
FLOW								
1	903 ~~864~~	618	98	78	81	180	7	194
2	891	642	71	72	39	120	63	151
3	1061	643	88	108	71	108	30	133
4	823	742	102	84	48	103	6	87
5	921	736	74		97	133	9	118
6			130					
7			121	35				
8			86					
9			77	3				
10			73	14				
11				4				
12				11				
13								
14				8				
15								
16								
17								
18								
19								
20								
TOTAL	4599	3401	1124		336	644	115	483
AVG	919.8	680.2	112.4		67.2	128.8	23	134.6
FIELD AREA								
FILTER AREA								
VOLUME			.411	.8				
CONCENTRATION	1.02							
					6.53	5.45	1.68	1.28

FINAL CNT X FILTER AREA
FIELD AREA X SAMPLE VOL

XA16906

CONWED CORP
DUST SAMPLING 8/9+10/72
By UNION CARBIDE'S EOKUFSKA
TOMKINS
(CONWED-CORP.)

#	F.Ht.Fl.	Type	Description
1	48	P.S.	Bulk Fiber Bagger - operator
Board & Reformer			
2	3	E.S.	No. 3 Board Mach. Run out Section (4' from end of Conveyor dumping mineral wool into stock chest)
3	26	E.S.	Mineral Slurry Hydropulper Tub (Eye level above Tub)
4.	35	P.S.	Slurry Hydropulper operator (same as 26 above)
Coating Make Up			
5	14	E.S.	Coating Make-up deck - Between #35 mix tank and Separan tank
6	27	P.S.	Coating Make-Up deck - on Coating make-up man as batch of #31 Coating is prepared.
Finishing Dept			
7	8	E.S.	No. 3 Trimmer Operators desk
8	43	E.S.	No. 4 " - 9' off floor on catwalk by 2nd Arbor
9	23	E.S.	Between #1+3 Board Dryers by W. Beale Hydropulper - 6' off floor
10	17	E.S.	No. 3 Dry end Coating line - Slitter Area - South Side - 6' off floor
11	21	E.S.	No. 3 Dry end Coating line - Station B E. grading station 6' off floor

X416907

No.	Filter No.	Type	Description
Tufflex Dept			
12	13	E.S.	No. 2 Tufflex line - Shredder Area eye level mound between Cotton linter feeder & E. Shredder Clomin blowdown with 3 air hoses during sampling
13	31	P.S.	No. 2 Tufflex Mach. - Transfer section on backfeeder helper's belt
Conwed Fabrics Dept			
14	28	P.S.	Conwed Fabrics Fiber Prep. room operator feeding Cotton linters into P & S feeders
Co-Tone Dept			
15-	20	E.S.	Co-Tone # 4 Line Grinder Area 6' off floor

X416908 V

COUNT SHEET

	10	2	9	7	3	14	
Sample #	17	3	23	8	26	28	1
Time							
Flow							
1	712	293	141	181	652	191	225
2	809	279	221	217	714	103	118
3	783	297	173	148	710	183	218
4	773	174	209	173	564	138	
5	831	236	164	203	708	154	
6		299	253	144		114	
7		283	184	208		116	
8		325	191	187		188	
9		294	149	238		153	
10		340	178	163		129	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
TOTAL	3908	2842	1863	1862	3348	1470	
AVG	781.6	284.2	186.3	186.2	669.6	147.0	187
Field Area	855	855	855	855	855	855	
Filter Area	.0654	→	→	→	→	→	
Volume	11.3878	6.69	6.75	2.52	7.75	0.4109	
Concentration	0.89	0.55	0.36	0.96	1.13	4.67	

Fiber Cnt x Filter Area

Field Area x Sample Vol ml

X416909

