Dr. Lipsky
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Interoffice Communication

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MEDICAL DIV.

To A. H. Sather

From J. V. Uptain

Date October 3, 1978

Subject CHEMICAL EXPOSURE MONITORING SUMMARY - THIRD QUARTER, 1978

I. COLOR WEIGH ROOM

High-volume sampling was repeated following the connection of the weigh hood to the compound ventilation system.

The results (see Table I) clearly indicate that exposures, particularly those related to the dustier material such as the barium/cadmium complexes, are still excessive, in spite of the increased airflow through the hood.

A proposal for modifying the color weigh room operation is being reviewed at writing.

II. COMPOUND LINE I AIR SAMPLING

Preliminary results of high-volume air sampling on Compound Line I appear in Table II. Although the final analysis for heavy metal content is not yet completed, the total particulate concentrations so far indicate no serious problems.

III. SILICON DIOXIDE

Four, 8-hour TWA dosimetry-type Silicon Dioxide samples, involving the Plasticizer Operators, were taken, using a "respirable fraction" vortex sampler (see Table IV). No significant exposures were found.

IV. PHTHALIC ANHYDRIDE

Ten dosimetry-type Phthalic Anhydride samples were taken, involving Yard Operators and Plasticizer Operators (see Table III). Work tasks studied were the routine production of plasticizer and the connection/disconnection of Phthalic Anhydride railcars. Exposures were well under established limits.

V. COMPOUND AREA HIGH-VOLUME SAMPLING

The results of 24 high-volume air samples taken on Compound Line III and in Dry Blend are shown in Table V. Except for 4 samples, the results are very encouraging. Two of the four results (#78-78 and #78-80) indicate total particulate and tin problems in the Dry Blend area, although the limited amount of information does not justify firm conclusions. Similarly, samples #78-65 & #78-89 indicate high lead concentrations in two Line III areas.

V. COMPOUND AREA HIGH-VOLUME SAMPLING (Cont.)

All in all, the results are better than anticipated, the difference probably due in large part to the compound ventilation system.

J. V. Uptain

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Attachments

c: Plant Manager, Department Heads, DSC, EDS, DAK, JJH, ODS

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TABLE I

COLOR WEIGH ROOM HIGH-VOLUME AIR SAMPLING

6/28/78 - 7/26/78

Sample No.	Material Sampled	TLV Mg/M^3	* Total Particulate Concentration, Mg/M^3
78-99	Barium/Cadmium	Ba: 0.5; Cd: 0.2	14.1
-105	" "	" ; "	23.5
-110	" "	" ; "	18.9
-114	" "	" ; "	15.0
-118	" "	" ; "	18.4
-119	" "	" ; "	14.0
-100	Antimony Trioxide	0.5 (Sb)	4.9
-101	" "	" "	10.1
-104	" "	" "	9.9
-113 a	" "	" "	3.1
-120	" "	" "	6.3
-109	" "	" "	12.4
-111	Dibasic Lead Phthalate	0.2 (Pb)	1.0
-112	Dibasic Lead Phthalate & Antimony Trioxide	Pb: 0.2; Sb: 0.5	4.1

* TLV for total particulates = 15 mg/m^3

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TABLE II

COMPOUND LINE I HIGH-VOLUME AIR SAMPLING

6/30/78 - 8/8/78

Material Being Sampled: Barium/Cadmium Complexes
TLV : 0.5 Mg/M^3 (Barium) ; 0.2 mg/M^3 (Cadmium)

Sample No.	Location	* Total Particulate Concentration, Mg/M^3
78-106	Between Blenders	2.0
-116	SE Corner of "B" Blender	3.5
-107	Between Blenders & Banbury	2.0
-115	" " "	0.9
-125	" " "	0.6
-108	Just SW of Mill	2.0
-117	" " " "	1.6
-128	" " " "	1.1
-126	Compounder's Desk	0.4

* TLV for total particulates = 15 Mg/M^3

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TABLE III

PHTHALIC ANHYDRIDE DOSIMETRY

7/10/78 - 8/23/78

TLV for Phthalic Anhydride = 12 Mg/M^3 (8 hour TWA)

Sample No.	Job Classification	Task	Sampling Time	Concentration, Mg/M^3
78-113	Plasticizer Operator	Plasticizer Production	5.3 hours	<3.8
-114 a	"	"	4.2 hours	<4.0
-121	"	"	6.5 hours	<0.03
-127	"	"	7.8 hours	<0.02
-129	"	"	6.5 hours	<0.03
-123	Yard Operator	Connecting R.C.	10 min.	<1.0
-124	" "	" "	18 min.	<0.6
-130	" "	" "	13 min.	1.0
-132	" "	" "	15 min.	0.7
-131	" "	Disconnecting R.C.	10 min.	1.0

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TABLE IV

SILICON DIOXIDE DOSIMETRY

7/13/78 - 8/25/78

TLV: 5 Mg/M^3 (Total), 2 Mg/M^3 (Respirable)

Employees Sampled: Plasticizer Operators

Sample No.	Concentration 8-hour TWA Respirable Fraction, Mg/M^3
115 a	0.25
SD-2	0.12
122	0.77
133	0.17

TABLE V

COMPOUND AREA HIGH-VOLUME AIR SAMPLING

3/10/78 - 5/25/78

SAMPLE NO.	78-17	78-27	78-33	78-46	78-47	78-65
CHEMICALS BEING SAMPLED	Alkytin Mercaptide	Dibasic Lead Phthalate / Tribasic Lead Sulphate				
SAMPLING LOCATION	3' W of SE Corner of Master Batch Charge Platform	3' E of E Line 3 Dicer Line	SE Corner of FCM Room	SE Corner of Line 3 Feeder Deck	E of Line 3 FCM/Mill Conveyor	SE Corner of Line 3 Feeder Deck

ELEMENT	CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR						TOXIC LIMIT VALUE (TLV)
Antimony	0.18	0.10	2.86	* <7.32	1.50	120.00	500
Barium	0.30	0.08	0.69	4.58	2.79	5.39	500
Cadmium	0.30	0.04	0.16	* <0.73	<0.38	* < 0.32	200
Chromium	0.04	0.02	<0.08	<0.73	<0.38	1.22	54.7 (As Cr in CrO_3)
Copper	0.06	0.08	0.24	<0.73	<0.38	< 0.32	1,000
Lead	1.76	3.66	45.48	18.31	46.95	198.36	200
Manganese	0.07	0.05	0.19	<0.73	< 0.38	< 0.32	500
Tin	0.10	0.02	* <0.08	<0.73	* < 0.38	< 0.32	100
TOTAL PARTICULATES	1,600	210	860	6,000	5,000	6,000	15,000
** Equivalent Exposure (Mixture)	0.01	0.02	0.24	0.14	0.26	1.27	1.00

* No emission line observed for this element. All < or > values were outside calibration range.

** $E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \ldots\ldots\frac{Cn}{Ln}$, where: Em is the equivalent exposure of the mixture , C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

TABLE V (Cont.)

COMPOUND AREA HIGH-VOLUME AIR SAMPLING

3/10/78 - 5/25/78

SAMPLE NO.	78-88	78-89	78-90	78-91	78-92	78-93
CHEMICALS BEING SAMPLED	Dibasic Lead Phthalate, Tribasic Lead Sulphate		Alkytin Mercaptide		Tribasic Lead Sulphate, Antimony Trioxide	Alkytin Mercaptide, Dibasic Lead Phthalate, Tribasic Lead Sulphate
SAMPLING LOCATION	4' E of Line 3 Blenders, 2nd Floor Level	Line 3 Blender Platform	Dry Blend/Line 3 Control Room	Dry Blend Master Batch Platform Between Hoods	SE Corner of Line 3 Blender Platform	Between Line 3 and Dry Blend Charge Platforms, 2nd. Floor Level.

ELEMENT	CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR						TOXIC LIMIT VALUE (TLV)
Antimony	* < 1.44	7.31	1.22	5.81	12.98	1.19	500
Barium	< 0.14	0.70	1.72	1.99	6.49	0.45	500
Cadmium	* < 0.14	* < 0.46	* < 0.02	* < 0.08	* < 0.12	* < 0.11	200
Chromium	< 0.14	< 0.46	0.31	0.85	< 0.12	< 0.11	54.7 (As Cr in CrO_3)
Copper	< 0.14	< 0.46	1.53	< 0.08	< 0.12	0.48	1,000
Lead	20.61	>460.46	2.45	10.35	35.14	12.78	200
Manganese	0.18	< 0.46	0.03	< 0.08	0.16	0.16	500
Tin	0.50	0.79	0.65	0.55	1.97	1.08	100
TOTAL PARTICULATES	1,680	3,790	580	1,500	1,600	1,500	15,000
** Equivalent Exposure (Mixture)	0.12	2.34	0.03	0.09	0.24	0.08	1.00

* No emission line observed for this element. All < or > values were outside calibration range.

** $E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \ldots\ldots\frac{Cn}{Ln}$, where: Em is the equivalent exposure of the mixture , C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

TABLE V (Cont.)

COMPOUND AREA HIGH-VOLUME AIR SAMPLING

3/10/78 - 5/25/78

SAMPLE NO.	78-66	78-67	78-68	78-76	78-77	78-78
CHEMICALS BEING SAMPLED	Tribasic Lead Sulphate, Antimony Trioxide →			Barium/Cadmium Complexes →		Di(N-Butyl Tin) SS Bis (iso-octyl) Mercapto Acetate
SAMPLING LOCATION	SW Corner of Line 3 Feeder Deck	E of Line 3 FCM/Mill Conveyor	3' E of Line 3 E Dicer Line	Line 3 Mill, Oper. Station →		Dry BLend Mezanine, Just above 2nd floor

ELEMENT	CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR						TOXIC LIMIT VALUE (TLV)
Antimony	15.14	16.32	2.64	0.11	0.15	17.47	500
Barium	0.63	1.90	0.21	0.09	0.20	0.73	500
Cadmium	* < 0.34	0.21	0.03	0.05	0.08	* < 0.39	200
Chromium	0.35	0.20	0.04	0.01	0.02	0.41	54.7 (As Cr in CrO_3)
Copper	< 0.34	0.16	0.04	0.10	0.02	< 0.39	1,000
Lead	20.07	46.63	3.31	0.72	4.46	23.15	200
Manganese	< 0.34	0.21	0.05	0.05	0.02	< 0.39	500
Tin	33.81	0.11	0.03	0.02	0.02	39.00	100
TOTAL PARTICULATES	5,520	930	160	645	771	8,720	15,000
** Equivalent Exposure (Mixture)	0.48	0.28	0.02	0.01	0.02	0.53	1.00

* No emission line observed for this element. All < or > values were outside calibration range.

** $E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \ldots\ldots\frac{Cn}{Ln}$, where: Em is the equivalent exposure of the mixture , C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

TABLE V (Cont.)

COMPOUND AREA HIGH-VOLUME AIR SAMPLING

3/10/78 - 5/25/78

SAMPLE NO.	78-79	78-80	78-81	78-84	78-86	78-87
CHEMICALS BEING SAMPLED	Di(N-Butyl Tin) SS Bis (iso-octyl) Mercapto Acetate	→	→	Tribasic Lead Sulphate, Antimony Trioxide	Dibasic Lead Phthalate, Tribasic Lead Sulphate	→
SAMPLING LOCATION	Dry Blend Mezanine Just Above 2nd Floor	Dry Blend Mezanine Between 1st & 2nd Floors	→	Line 3 Mill, Oper. Station	SE Corner Line 3 Blender Platform	4' E of Line 3 Blenders, 2nd Floor Level

ELEMENT	CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR						TOXIC LIMIT VALUE (TLV)
Antimony	12.10	12.53	22.85	11.76	22.06	2.12	500
Barium	0.70	1.39	1.77	0.74	0.25	0.38	500
Cadmium	* < 0.22	* < 0.65	* < 0.20	0.09	* < 0.08	* < 0.03	200
Chromium	0.35	7.89	0.38	0.18	< 0.08	0.04	54.7
Copper	< 0.22	< 0.65	< 0.20	0.15	< 0.08	< 0.03	1,000 (As Cr in CrO_3)
Lead	21.79	35.26	31.50	8.82	14.71	6.44	200
Manganese	< 0.22	< 0.65	< 0.20	0.13	0.53	0.46	500
Tin	15.60	74.23	27.00	0.12	0.33	0.17	100
TOTAL PARTICULATES	4,860	14,530	5,670	1,010	1,100	459	15,000
** Equivalent Exposure (Mixture)	0.30	1.10	0.49	0.07	0.12	0.04	1.00

* No emission line observed for this element. All < or > values were outside calibration range.

** $E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \ldots\ldots\frac{Cn}{Ln}$, where: Em is the equivalent exposure of the mixture , C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.