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CONOCO

Interoffice Communication

RECEIVED

JAN 8 1979

MEDICAL DIV

To A. H. Sather

From J. V. Uptain 72-416-281

Date December 20, 1978

Subject CHEMICAL EXPOSURE MONITORING SUMMARY -FOURTH QUARTER, 1978

I. Spray Metalizing

For some time we have utilized a crude "flame coating" process in the maintenance shop for building up metal parts, particularly shafts and similar round objects. The process consists of metering finely divided metal powders, made for the purpose, into a flame, which contacts the metal part to be built up. Some concern developed that workers in the area might, as a result, be overly exposed to heavy metals, since no controls for limiting the airborne concentration were present.

On 10/4/78, eleven (11) air samples were taken, while the various powders were used. The results appear in Table I and clearly show that better controls are needed. Since generation of the fumes is confined to one place in the shop, the most efficient control appears to be an adequately designed, local ventilation/exhaust system. This subject is under discussion at writing.

II. Compound Line I Air Sampling

The final results of the high volume air samples taken on Compound Line I appear in Table II. Although one antimony result (sample 78-102) and one barium result (sample 78-116) are disturbingly high, the most significant problem appears to be lead - especially in view of the new OSHA Lead Standard.

III. Color Weigh Room

Final analysis results of color weigh room sampling done since connection of the weigh hood to the compound ventilation system appear in Table III. As can be seen, the concentrations of heavy metals are still too high and little, if any, improvement was realized by the hood change. At writing, plans are being cast for re-vamping of the entire operation, including the ventilation equipment.

IV. 1978 Lead-in-Air Measurements

In anticipation of the questions to be raised as the effective date of the new OSHA Lead Standard approaches, all of the 1978 lead-in-air measurements made with the high volume technique were summarized (see Table IV).

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IV. 1978 Lead-in-Air Measurements (Cont.)

These measurements were all area-type in nature and, although they are no substitute for the dosimetry specified in the new standard, will be helpful during the "initial determination" that will be required.

V. Trimellitic Anhydride

During bag charging of trimellitic anhydride to a plasticizer reactor, one sample was taken. The airborne concentration was found to be 13 milligrams per cubic meter, somewhat high. More samples are needed to better define the hazard. In the meantime, operators are required to wear respiratory protection during the task, which occurs only during the occasional production of TOTM.

VI. Carbon Black

Several samples were taken of worker breathing zone air while they were charging carbon into plasticizer reactors. All results were essentially zero, with no significant danger being apparent.

VII. Hydroquinone

Six air samples were taken in the PVC reactor areas to define airborne concentration of hydroquinone. All results were negative.

Jerald V. Uptain

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

jf

VAB.00010500073

TABLE I

SPRAY-METALIZING HIGH-VOLUME AIR SAMPLING

10/4/78

Sample No.	78-134	78-135	78-136	78-137	78-138	78-139	78-140
Metal Powder Type Used	450	451	44	91	51	51	91
Sampling Location	Operator's Station, Face Level →					Opposite Side of Lathe from Operator →	

Element	Airborne Concentration, Micrograms per Cubic Meter of Air							Permissable Exposure Limit (PEL)
Cadmium	1.57	0.67	0.27	0.75	< 0.38	1.42	0.42	100
Copper	5.74	1.95	1.31	6.53	> 378.13	> 711.56	162.65	100
Zinc	1.40	1.72	0.51	1.46	1.72	3.40	0.85	500
Chromium	1.25	9.57	> 106.96	14.44	0.43	1.08	2.20	54.7 (As Cr in CrO_3)
Nickel	> 194.62	> 88.63	> 106.96	18.39	1.89	3.09	1.08	100
Iron	12.97	5.32	28.15	> 217.56	< 18.91*	< 64.97*	> 237.20	10,000
Barium	1.10	0.55	0.11	0.38	0.38	0.71	0.36	500
Manganese	0.42	3.01	2.11	8.90	1.08	2.13	8.30	500
Lead	5.24	3.19	0.75	1.64	2.23	4.33	1.37	200 (50 in 1979)
Tin	0.32	0.43	< 0.11	0.67	< 0.38	0.71	0.68	100
TOTAL PARTICULATES:	590	1,200	1,100	1,500	970	2,700	300	15,000
** Equivalent Exposure (Mixture)	2.08	1.12	3.05	0.58	3.84	7.23	1.74	1.00

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

** $Em = \frac{C1}{L1} + \frac{C2}{L2} + \ldots \frac{Cn}{Ln}$, where: EM = Equivalent Exposure of the Mixture, C = Concentration of a particular contaminant, L = Exposure limit for that contaminant.

VAB.000105007A

TABLE I (Continued)

SPRAY-METALIZING HIGH-VOLUME AIR SAMPLING

10/4/78

Sample No.	78-141	78-142	78-143	78-144
Metal Powder Type Used	450	44	451	None
Sampling Location	Opposite Side of Lathe from Operator →			Middle of Maintenance Shop Floor

Element	Airborne Concentration, Micrograms per Cubic Meter of Air				Permissable Exposure Limit (PEL)
Cadmium	0.52	0.45	1.28	0.13	100
Copper	24.14	31.51	28.63	0.91	100
Zinc	1.15	1.30	2.19	0.25	500
Chromium	5.55	>216.64	141.48	0.15	54.7 (As Cr in CrO_3)
Nickel	>458.66	>216.64	>336.86	0.85	100
Iron	15.69	>216.64	48.84	4.38	10,000
Barium	<0.46	0.75	1.18	0.47	500
Manganese	1.69	9.85	10.78	0.09	500
Lead	2.29	1.97	5.22	0.96	200 (50 in 1979)
Tin	<0.46	0.30	<0.34	0.11	100
TOTAL PARTICULATES	2,700	2,400	2,900	160	15,000
** Equivalent Exposure (Mixture)	4.96	6.50	6.32	0.03	1.00

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

** $EM = \frac{C1}{L1} + \frac{C2}{L2} + \ldots \frac{Cn}{Ln}$, where: EM = Equivalent Exposure of the Mixture, C = Concentration of a particular contaminant, L = Exposure limit for that contaminant.

VAB.000105007S

TABLE II

COMPOUND LINE I HIGH-VOLUME AIR SAMPLING

6/30/78 - 8/8/78

CHEMICAL BEING SAMPLED: BARIUM/CADMIUM COMPLEX

Sample No.	78-102	78-106	78-107	78-108	78-115	78-116	
Sampling Location	Between Blenders	SW Corner, "B" Blender	Between Blenders & Banbury	SW Corner of Mill	Between Blenders & Banbury	SE Corner, "B" Blender	
Element	Concentration, Micrograms per Cubic Meter of Air						Toxic Limit Value (TLV)
Antimony	300.33	24.56	8.46	> 70.36	4.07	< 0.31*	500
Barium	131.40	8.19	12.96	6.16	10.50	236.50	500
Cadmium	0.14	< 0.13	1.60	0.75	2.54	54.20	200
Chromium	< 1.41	0.17	0.30	0.22	< 0.22	< 0.31	54.7 (AS Cr in CrO_3)
Copper	< 1.41	11.19	< 0.06	< 0.07*	< 0.22	< 0.31	1,000
Lead	103.24	7.28	34.30	22.87	> 52.49	15.77	200
Manganese	35.66	2.86	4.45	5.28	0.44	0.37	500
Tin	< 1.41*	0.13	< 0.06*	0.88	13.12	< 0.31*	100
TOTAL PARTICULATES	11,900	2,000	2,000	2,000	890	3,500	15,000
** Equivalent Exposure (Mixture)	1.49	0.12	0.24	0.28	0.44	0.83	1.00

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

** $EM = \frac{C1}{L1} + \frac{C2}{L2} + \ldots \frac{Cn}{Ln}$, where: EM = Equivalent Exposure of the Mixture, C = Concentration of a particular contaminant, L = Exposure limit for that contaminant.

VAB.000105007G

TABLE II (Continued)

COMPOUND LINE I HIGH-VOLUME AIR SAMPLING

6/30/78 - 8/8/78

CHEMICAL BEING SAMPLED: BARIUM/CADMIUM COMPLEX

Sample No.	78-117	78-125	78-126	78-128	
Sampling Location	SW Corner of Mill	Between Blenders & Banbury	Compounder's Desk	SW Corner of Mill	
Element	Concentration, Micrograms per Cubic Meter of Air				Toxic Limit Value (TLV)
Antimony	< 0.11*	12.13	< 0.01*	< 0.04	500
Barium	3.34	52.57	0.14	0.48	500
Cadmium	1.20	18.20	0.13	0.03	200
Chromium	< 0.11	< 0.92	< 0.01*	< 0.04	54.7 (As Cr in CrO_3)
Copper	0.12	2.53	0.03	0.08	1,000
Lead	5.56	272.94	2.55	9.04	200
Manganese	0.18	1.92	0.04	0.07	500
Tin	< 0.11*	2.22	0.03	0.06	100
TOTAL PARTICULATES	1,600	590	400	1,100	15,000
** Equivalent Exposure (Mixture)	0.04	1.63	0.01	0.05	1.00

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

** $EM = \frac{C1}{L1} + \frac{C2}{L2} + \ldots \frac{Cn}{Ln}$, wher: EM = Equivlaent Exposure of the Mixture, C = Concentration of a particular contaminant, L = Exposure limit for that contaminant.

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TABLE III

COLOR WEIGH ROOM HIGH VOLUME AIR SAMPLING

6/22/78 - 7/20/78

Sample No.	78-94	78-98	78-101	78-104	78-105	78-109	78-110	
Element	Concentration, Micrograms per Cubic Meter of Air							Toxic Limit Value (TLV)
Antimony	3.06	16.53	>519.77	>2,537.76	70.79	>1,261.13	126.93	500
Barium	30.62	22.44	87.47	28.00	<0.77	38.38	21.23	500
Cadmium	1.64	93.85	19.02	< 0.25	707.91	2.19	55.39	200
Chromium	0.12	< 0.09	2.41	< 2.54	2.16	< 1.26*	3.23	54.7 (As Cr in CrO_3)
Copper	<0.03	<0.09	< 0.52	< 2.54	< 0.77	< 1.26	<10.39	1,000
Lead	10.68	6.53	0.38	201.27	47.19	62.14	1,038.53	200
Manganese	0.43	0.22	< 0.51	< 2.54	< 0.77	<1.26	<10.39*	500
Tin	0.05	<0.09	0.56	<1.31*	< 0.77*	<1.26*	<10.39*	100
TOTAL PARTICULATES	720	16,100	10,100	9,900	23,500	12,400	18,900	15,000
** Equivalent Exposure	0.13	0.58	1.36	6.21	3.97	2.96	5.96	1.00

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

** $Em = \frac{C1}{L1} + \frac{C2}{L2} + \ldots \frac{Cn}{Ln}$, where: EM = Equivalent Exposure of the Mixture, C = Concentration of a particular contaminant, L = Exposure limit for that contaminant.

VAB.000105007S

TABLE III

COLOR WEIGH ROOM HIGH VOLUME AIR SAMPLING

6/22/78 - 7/20/78

Sample No.	78-111	78-112	78-118	Toxic Limit Value (TLV)
Element	Concentration, Micrograms per Cubic Meter of Air			
Antimony	51.05	28.24	< 0.90*	500
Barium	12.00	13.45	458.52	500
Cadmium	1.53	4.57	592.54	200
Chromium	0.86	< 0.38	< 0.90	54.7 (As Cr in CrO_3)
Copper	< 0.01	< 0.38	< 0.90	1,000
Lead	> 178.66	> 376.54	22.57	200
Manganese	< 0.18	< 0.38*	< 0.90*	500
Tin	0.43	< 0.38*	< 0.90*	100
TOTAL PARTICULATES	990	4,000	18,400	15,000
** Equivalent Exposure (Mixture)	1.05	2.00	4.02	1.00

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

** $Em = \frac{C1}{L1} + \frac{C2}{L2} + \ldots \frac{Cn}{Ln}$, where: EM = Equivalent Exposure of the Mixture, C = Concentration of a particular contaminant, L = Exposure limit for that contaminant.

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TABLE IV

RECAP OF 1978 LEAD IN AIR MEASUREMENTS

-HIGH VOLUME AIR SAMPLING-

Sample No.	Location	Concentration, Micrograms per Cubic Meter of Air
78-1	Color Weigh Room	< 0.5
78-2	Color Weigh Room	217.4
78-3	Color Weigh Room	390.0
78-4	Color Weigh Room	170.4
78-5	Color Weigh Room	171.4
78-6	Color Weigh Room	> 327.3
78-7	Color Weigh Room	291.9
78-8	Color Weigh Room	162.6
78-9	Color Weigh Room	70.0
78-10	Color Weigh Room	575.0
78-11	Color Weigh Room	34.8
78-12	Color Weigh Room	516.9
78-13	Color Weigh Room	26.4
78-94	Color Weigh Room	10.68
78-98	Color Weigh Room	6.53
78-101	Color Weigh Room	0.38
78-104	Color Weigh Room	201.27
78-105	Color Weigh Room	47.19
78-109	Color Weigh Room	62.14
78-110	Color Weigh Room	1,038.53
78-111	Color Weigh Room	> 178.66
78-112	Color Weigh Room	> 376.54
78-118	Color Weigh Room	22.57
78-102	Compound Line I - Between Blenders	103.24
78-106	Compound Line I - SE Corner, "B" Blender	7.28
78-107	Compound Line I - Between Blenders & Banbury	34.38
78-108	Compound Line I - SW Corner of Mill	22.87
78-115	Compound Line I - Between Blenders & Banbury	> 52.49
78-116	Compound Line I - SE Corner, "B" Blender	15.77
78-117	Compound Line I - SW Corner of Mill	5.56
78-125	Compound Line I - Between Blenders & Banbury	272.94
78-126	Compound Line I - Compounder's Desk	2.55
78-128	Compound Line I - SW Corner of Mill	9.04
78-17	Compound Line III - 3' W of SE Corner of Master Batch Charge Platform	1.76
78-27	Compound Line III - 3' E of E. Dicer Line	3.66
78-33	Compound Line III - SE Corner, FCM Room	45.48
78-46	Compound Line III - SE Corner, Feeder Deck	18.31
78-47	Compound Line III - E of FCM/Mill Conveyor	46.95
78-65	Compound Line III - SE Corner, Feeder Deck	198.36
78-140	Maintenance Shop - Spray Metalizing	1.37
78-141	Maintenance Shop - Spray Metalizing	2.29
78-142	Maintenance Shop - Spray Metalizing	1.97
78-143	Maintenance Shop - Spray Metalizing	5.22
78-144	Maintenance Shop - Middle of Room	0.96

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JAN 10 1979

MEDICAL DIV

Interoffice Communication

To A. H. Sather

From J. V. Uptain

Date January 5, 1979

Subject CONTINUOUS MONITORING SUMMARY FOR DECEMBER, 1978

Stream No.	1	2	3	4	5	6	7	8	9	10	% of Total
Laboratory Unit											
Range, PPM											
.0 - 0.5	744	743	744	743	743	742	742	742	744	744	99.5
0.5 - 1.0	0	1	0	1	1	2	2	2	0	0	0.1
1.0 - 5.0	0	0	0	0	0	0	0	0	0	0	0.0
+ 5.0	0	0	0	0	0	0	0	0	0	0	0.0
% over 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
New Large Reactor Area "B" Path											
Range, PPM											
.0 - 0.5	625	650	635	561	678	652	653	665	665	583	86.2
0.5 - 1.0	41	49	56	66	45	55	57	53	53	53	7.1
1.0 - 5.0	56	33	43	93	23	28	26	19	19	69	5.5
+ 5.0	16	3	5	19	3	4	3	2	2	35	1.1
% over 5	2.30	0.41	0.68	2.57	0.41	0.54	0.41	0.27	0.27	3.88	-
Old Large Reactor Area											
Range, PPM											
.0 - 0.5	527	268	426	273	425	533	455	450	495	436	59.7
0.5 - 1.0	36	38	60	66	47	31	45	56	33	44	6.4
1.0 - 5.0	157	361	723	321	235	154	218	235	214	197	33.2
+ 5.0	0	53	15	60	5	1	2	11	4	24	2.7
% over 5	0.00	7.36	2.08	8.33	0.69	0.14	0.28	1.53	0.56	3.33	-
Tank Farm Area											
Range, PPM											
.0 - 0.5	737	738	717	723	739	681	738	740	740	740	98.0
0.5 - 1.0	4	3	11	8	4	6	4	2	3	2	0.6
1.0 - 5.0	3	3	16	13	1	57	2	2	1	2	1.4
+ 5.0	0	0	0	0	0	0	0	0	0	0	0.0
% over 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Jerald V. Uptain

c: GGD, Dept. Heads, DAK-Houston, ODS-Ponca City

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VAB.0001050080

TABLE IV (Continued)

Sample No.	Location	Concentration, Micrograms per Cubic Meter of Air
78-66	Compound Line III - SW Corner, Feeder Deck	20.07
78-67	Compound Line III - E. of FCM/Mill Conveyor	46.63
78-68	Compound Line III - 3' E of E Dicer Line	3.31
78-76	Compound Line III - Mill Oper. Station	0.72
78-77	Compound Line III - Mill, Oper. Station	4.46
78-84	Compound Line III - Mill, Oper. Station	8.82
78-86	Compound Line III - SE Corner, Blender Platform	14.71
78-87	Compound Line III - 4' E of Blenders, Floor level	6.44
78-88	Compound Line III - 4' E of Blenders, Floor level	20.61
78-89	Compound Line III - Blender Platform	>460.46
78-90	Compound Line III - Control Room	2.45
78-92	Compound Line III - SE Corner, Blender Platform	35.14
78-93	Compound Line III - Between Line 3 & Dry Blend Charge Platforms, Floor level.	12.78
78-20	Dry Blend - Mezzanine Above 2nd Floor	27.9
78-21	Dry Blend - Mezzanine Above 2nd Floor	2.1
78-25	Dry Blend - Mezzanine Above 2nd Floor	3.7
78-51	Dry Blend - Mezzanine Between 1st & 2nd Floor	2.11
78-52	Dry Blend - Mezzanine Between 1st & 2nd Floor	3.73
78-73	Dry Blend Mezzanine Between 1st & 2nd Floors	3.04
78-54	Dry Blend - Basement, Blender Platform	4.05
78-55	Dry Blend - Basement, Blender Platform	9.03
78-56	Dry Blend - Basement Blender Platform	8.10
78-78	Dry Blend - Mezzanine Above 2nd Floor	23.15
78-79	Dry Blend - Mezzanine Above 2nd Floor	21.79
78-80	Dry Blend - Mezzanine Between 1st & 2nd Floors	35.26
78-81	Dry Blend - Mezzanine Between 1st & 2nd Floors	31.50
78-91	Dry Blend - Master Batch Platform, Between Hoods	10.35
78-134	Maintenance Shop - Spray Metalizing	5.24
78-135	Maintenance Shop - Spray Metalizing	3.19
78-136	Maintenance Shop - Spray Metalizing	0.75
78-137	Maintenance Shop - Spray Metalizing	1.64
78-138	Maintenance Shop - Spray Metalizing	2.23
78-139	Maintenance Shop - Spray Metalizing	4.33
78-140	Maintenance Shop - Spray Metalizing	1.37
78-141	Maintenance Shop - Spray Metalizing	2.29
78-142	Maintenance Shop - Spray Metalizing	1.97
78-143	Maintenance Shop - Spray Metalizing	5.22
78-144	Maintenance Shop - Middle of Room	0.96

HONEYWELL CONTINUOUS MONITOR STREAM LOCATIONS

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Laboratory

Stream No.	Location
1	Mounted on middle bagger in warehouse
2	Mounted in Quality Control Laboratory
3	Mounted on Line I Blenders
4	Mounted on Line III mill
5	Mounted in Development Laboratory
6	Mounted on Welex Deck in Dry Blend
7	Mounted in Dry Blend Control Room
8	Mounted on Dry Blend Blender
9	Mounted in Section B of East warehouse
10	Mounted on shrink wrap unit

Large Reactor Area

Stream No.	Location
1	Mounted at east side of Control Room
2	Mounted at #3 VCM Receiver
3	Mounted on 1st floor at R-5 Reactor
4	Mounted on second floor of Large Recovery System
5	Mounted above Space
6	Mounted on 1st floor, bottom of R-300
7	Mounted at top of R-300
8	Mounted at bottom of R-500
9	Mounted at top of R-400
10	Mounted on inlet air to Control Room

Dryer Building

Stream No.	Location
1	Mounted on 1st floor between #5 & #6 activator
2	Mounted in Dryer Control Room
3	Mounted on 1st floor between #7 & #8 activator
4	Mounted on 2nd floor sifter area east of #6
5	Mounted on 1st floor under slurry base station
6	Mounted on 1st floor between #7 & #8 Birds
7	Mounted on 1st floor between #4 & #5 Birds
8	Mounted on 2nd floor between # 7 & #8 Birds
9	Mounted on 2nd floor between #4 & #5 Birds
10	Mounted on V-10 bagger

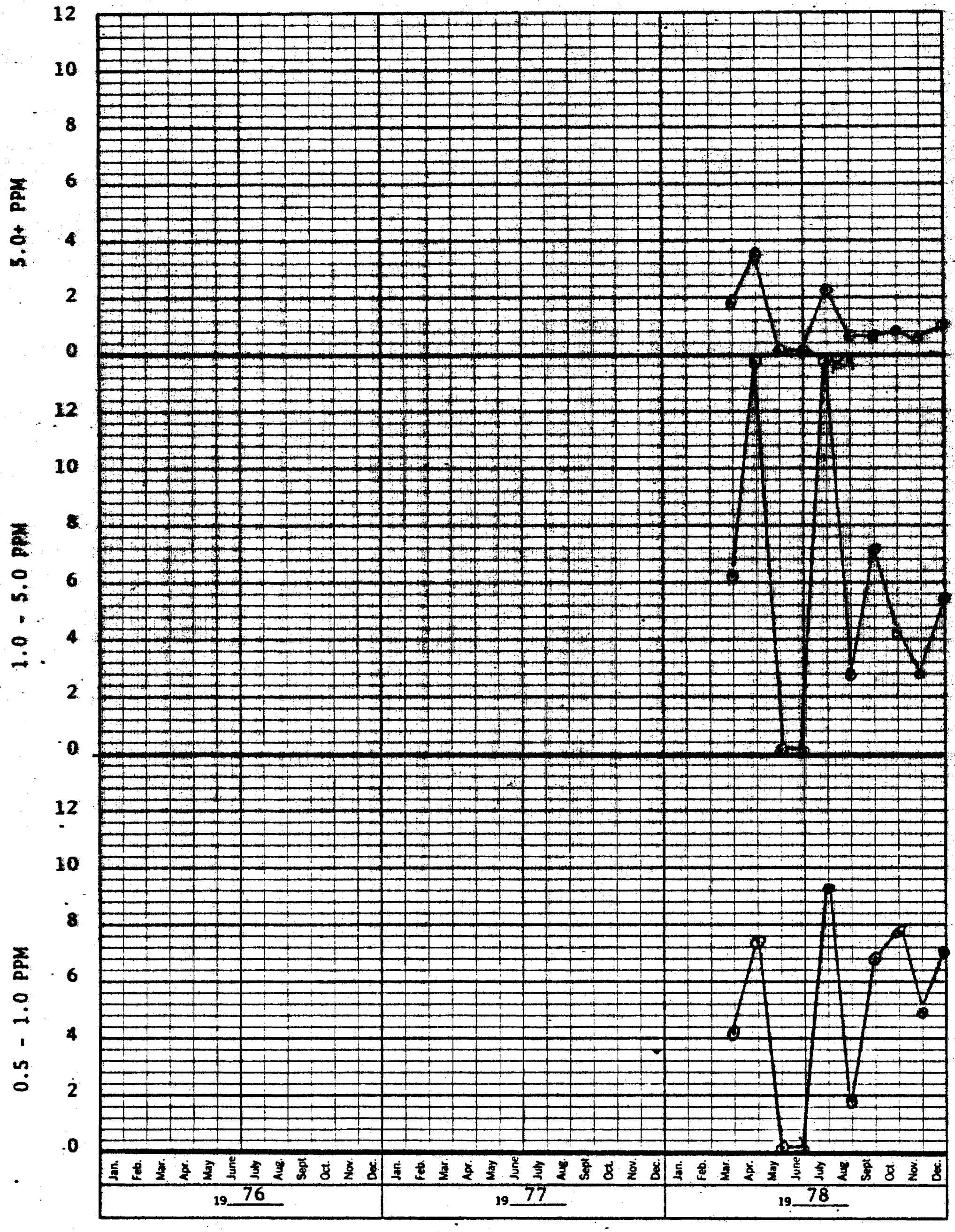
VCM Tank Farm

Stream No.	Location
1	Mounted on bottom of D-600 reactor
2	Mounted at #3 Recovery System
3	Mounted at South unloading station
4	Mounted at respiratory air inlet
5	Mounted at middle unloading station
6	Mounted ar North unloading station
7	Mounted at Compressor shed
8	Mounted at blowdown tank - South end
9	Mounted at North Receiver
10	Mounted at Gear Room (West side)

VAB.0001050082

ABERDEEN NEW LARGE REACTOR VCM CONTINUOUS MONITORING UNIT TRENDS

PERCENTAGE OF SAMPLES WITHIN CONCENTRATION RANGES



Unit down all of May and June. Placed back into service 7/12/78.

VAB.0001050083

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ABERDEEN LABORATORY VCM CONTINUOUS MONITORING UNIT TRENDS
-PERCENTAGE OF SAMPLES WITHIN CONCENTRATION RANGES

46 3290
K·E 3 YEARS BY MONTHS
KEUFFEL & ESSER CO.

VAB.0001050084

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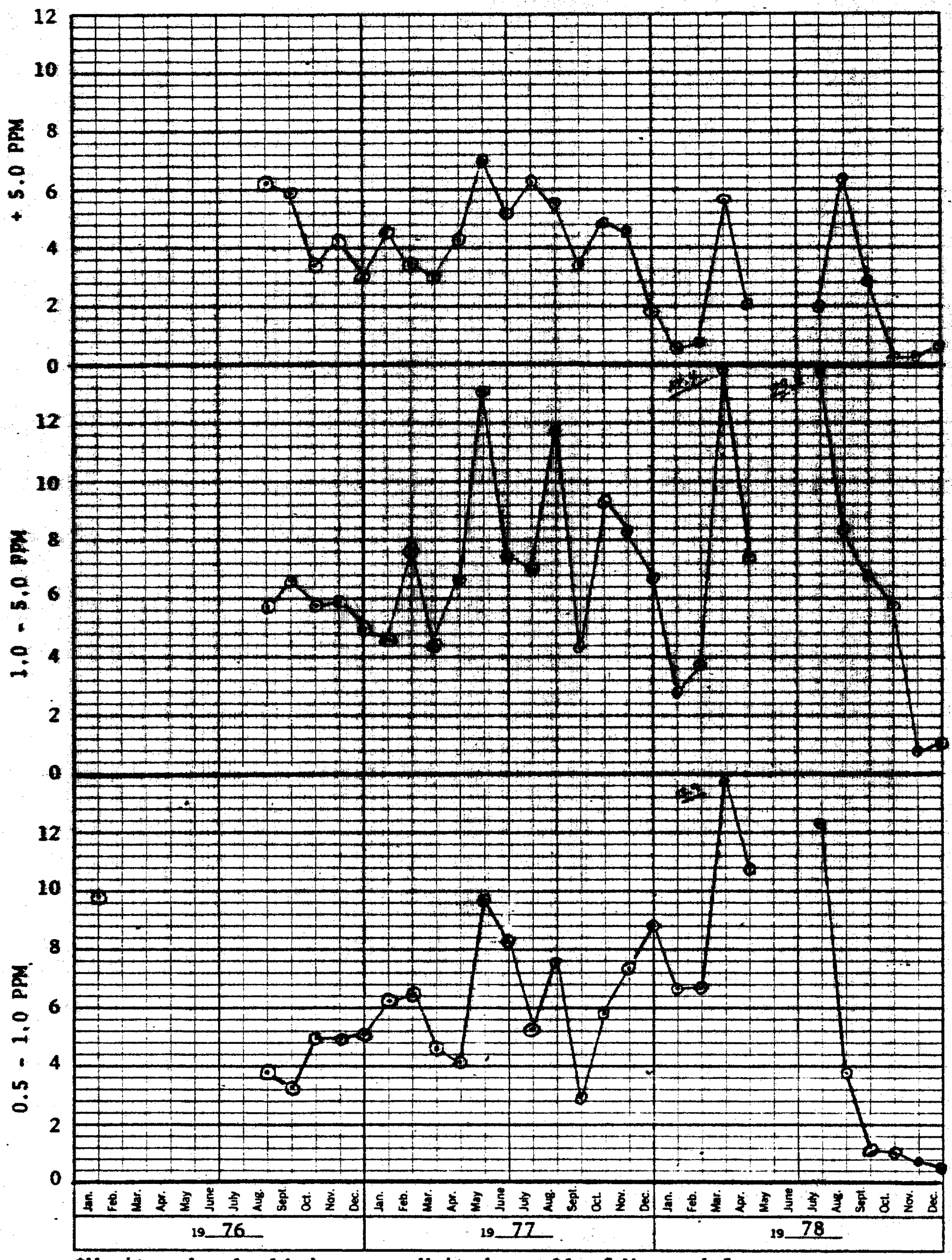
ABERDEEN VCM TANK CONTINUOUS MONITORING UNIT TRENDS
-PERCENTAGE OF SAMPLES WITHIN CONCENTRATION RANGES



*Monitored only 14 days in August, 1976

Unit down all of May and June.

K&E 3 YEARS BY MONTHS X 100 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 3280

VAB.0001050085

ABERDEEN OLD LARGE REACTOR VCM CONTINUOUS MONITORING UNIT TRENDS
-PERCENTAGE OF SAMPLES WITHIN COCENTRATION RANGES

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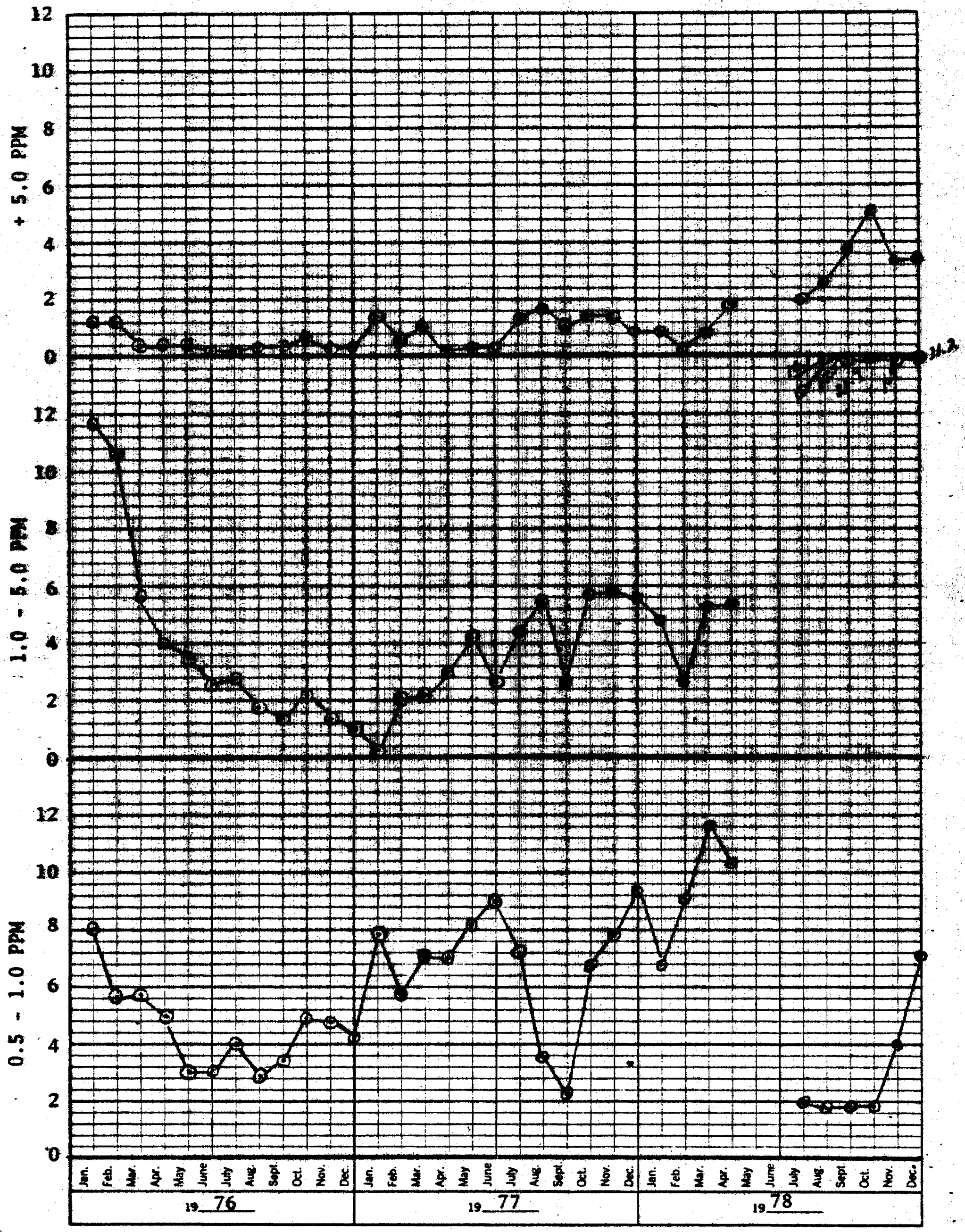

Unit down all of May and June. Placed back into service 7/12/78.

VAB.0001050086

46 3290
K+E 3 YEARS BY MONTHS X 100 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.