

Monsanto

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T. M. Bistline - E2ND

Dioxin Levels - Nitro 2,4,5-T Plants

Memo: JLH/HCG-DLW 7/11/83

J. L. Henshaw - G2WB

ATTORNEY WORK PRODUCT
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In response to your reference memo, we have examined the three Nitro 2,4,5-T plants to determine the areas of highest exposure and probable dioxin (TCDD) levels. The results are summarized on the attached table. Marked-up flowsheets are also attached to aid in clarity.

Two sets of data are presented for the second plant which operated from 1953 to 1962. As originally started up, that plant included a filter for NaTCP. Later research showed that such a filtration step could remove 88 percent of the TCDD present. Filtration was, however, a high exposure operation. As a result, filtration was eliminated by 1956 and downstream TCDD levels would have increased. This is reflected in the levels shown for 1956-1962. Filtration of NaTCP was always used in Plant 1 and never used in Plant 3.

All concentration data presented should be reviewed as order of magnitude only. TCDD levels in the NaTCP were estimated based on extensive research data published by J. L. Sims and W. R. Udell (Monsanto Agricultural Division, Agricultural Research Report No. 150, Final Report on 2,4,5-Trichlorophenol - Optimization of the Hydrolysis of 1,2,4,5-Tetrachlorobenzene, Job No. 9-23-760.01-2102) and knowledge of autoclave conditions used at the various times. TCDD levels in the final product were taken from actual lab analysis from 1958 until production ceased in 1969. All other concentrations are estimates.

Please advise if you have any questions. We would be happy to discuss this information with you as required.

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/sd

Attachment

C17995

2,4,5-T PRODUCTION, NITRO

AREAS OF HIGHEST OPERATOR EXPOSURE

(NA = Not Applicable)

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Operation	Estimated PPM TCDD			
	Plant 1	Plant 2	Plant 3	
	1948- 1952	1953- 1955	1956- 1962	1963- 1969 ⁸
A. Cleaning NaTCP Filter Press ¹	30-60 ⁷	20-40 ⁷	NA	NA
B. Digging out cake from Na 2,4,5-T Centrifuges ²	5-10	5-10	10-20	NA
C. Cleaning out Na 2,4,5-T Slurry Filters ¹	1-5	1-5	NA	NA
D. 2,4,5-T Filtration Operation ³	1-10	NA	NA	5-25
E. Digging out cake from 2,4,5-T Centrifuge ²	NA	1-5	5-10	NA
F. Cleanout of Settling/Storage Tanks	5-10 ⁷	1-5 ⁷	15-30 ⁷	35-70
G. Rodding hopper feeding rotary dryer ⁴	NA	1-5	5-10	5-25
H. Assisting cake conveying operations ⁵	1-5	1-10	10-20	NA
I. Drying of Product on Tray Dryers ⁶	1-10	NA	NA	NA
J. Packaging of 2,4,5-T Product	1-10	1-5	5-10	5-25

¹ Operations eliminated by 1956.

² Plows added by 1958. No centrifuging in Plant 3.

³ High exposure applies to Plant 1 only. Plant 3 filter was automated thus low exposure.

⁴ Mechanical arch breaker (vibrating device) added by 1956.

⁵ Conveyors eliminated by 1960.

⁶ Tray dryers used in Plant 1 only. Rotary dryer used in Plants 2 and 3 thus low exposure.

⁷ Concentrations are for inlet stream. Actual cleanout operations would have resulted in exposure to cakes/residues/tars with a much higher TCDD content.

⁸ Exposure levels for Plant 3 are pre-1969. For the last eight months of operation (Jan.-Aug., 1969) changes were made in processing conditions which dramatically lowered TCDD levels; most product lots in the 1-3 ppm range.

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C17996

HCG/DLW
7/28/83