Monsanto

COMPANY CONFIDENTIAL

FROM (NAME & LOCATION): [redacted] Krummrich

DATE: April 6, 1972

SUBJECT: PCB - LOSS CONTROL PROGRAM STATUS

REFERENCE:

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It is believed that a pending paper from the Office of Science and Technology, an element of the executive branch of the Federal government, will recommend that polychlorinated biphenyl (PCB) levels in effluent streams be virtually reduced to zero. The paper will recommend that no PCB's will be detected in the plant effluent stream and PCB levels from the department will be a maximum of 0.01 parts per billion (ppb).

Comments related to the above possibility and how it relates to our current program for PCB control are summarized below.

I. Methodology - Chromatographic interference present when analyzing any plant stream will limit our detection of PCB's to about 1 ppb.

II. Current Levels - Village and plant losses measured at the Waste Treatment Plant Influent during past four months have averaged 191 ppb. (Equivalent to 24 #/day average.) Daily range of 27 to 543 ppb. Losses from the Waste Treatment Plant Effluent to the river have averaged 86 ppb. (Equivalent to 9 #/day average.) Daily range of 12 to 282 ppb.

III. Current Technology - Normal carbon treatment and filtration will permit removal of PCB's to about 5 ppb. No research is in progress to permit removal of PCB below the carbon adsorption-filtration capability. Carbon treatment at this time is not planned.

IV. Current Program - An existing program has been developed that should permit control of PCB losses from the department, the incinerator and the Rip Track wash area to an average daily loss of about 1 #/day in the fourth quarter of 1972. The program is based primarily on scrubbing all the HCl off-gas from the Aroclor department, and controlling-containing-recovering physical losses of PCB's in the operating areas.

IV. Current Program (continued)

It is conceivable and highly probable that residual PCB in WGK soils and sewers will continue to be leached for months to come. This amount could approach a daily average of 5 #/day.

V. Costs - The program to reduce PCB's from the current level to about 1 #/day will cost about $200,000 in project costs and technical effort.

At this time the technology is not available and the costs would probably be prohibitive to meet the standards that may be recommended by the Office of Science and Technology.

All plant efforts are directed toward reducing losses from known sources to 1 #/day.

See details attached.

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DETAILS

I. METHODOLOGY

At present we have no analytical method capable of measuring PCB's in plant effluent streams at a level of 0.01 ppb. Chromatographic interference present when analyzing any plant streams will limit our detection of PCB's to about 1 ppb. We report "no detectable PCB's" when none are detected at the 1 ppb level. Our method is accurate to about ± 30%.

The instrument itself is capable of measuring PCB's at the 0.01 ppb level but this would only be true if the sample were comparable to distilled water and the sample prepared at some point removed from the WGK environment. Background levels of PCB's in the WGK laboratory can distort results by as high as 5 ppb.

II. CURRENT LEVELS

Average or ranges of PCB levels in various streams are tabulated below.

A. Department 246 zone Effluent stream	Discontinued sampling at this point pending installation of facilities to permit more reliable and representative sampling of stream. Past data ranged from 70 to >5000 ppb. Equivalent to 0.2 to 15 # PCB/day.
B. Waste Treatment Plant Influent. (Reflects plant losses and input from Monsanto Village and neighbor industries)	Monthly daily average value during past four months was 191 ppb with a range of 27 to 543 ppb. Equivalent to 24 #/day average.
C. Waste Treatment Plant Effluent (Flow to river after removing scum and settleable solids.)	Monthly daily average value during past four months was 86 ppb with a range of 12 to 282 ppb. (Equivalent to 9 #/day average.)
D. Miscellaneous streams analyzed during past year.	
1. River Raney Well Water	4 - 33 ppb
2. Ground Water adjacent to Dept. 246	83 - 290 ppb

II. CURRENT LEVELS (continued)

D. 3. Streams from neighboring industries (Midwest Rubber, American Zinc, Cerro, Mobil, Cooper.) — 6 - 56 ppb

4. Tank Car Wash Water from Rip Track — 6,000 - 150,000 ppb

5. Plant Cooling Tower Water — No detectable PCB's

6. Plant City Water — No detectable PCB's

III. CURRENT TECHNOLOGY - Removal from aqueous streams

A. Filtration - Can remove about 80-90% of the PCB that are initially present. Have been about 3 ppb after filtration of material at 40 ppb level initially.

B. Carbon Treatment - Anniston data indicate PCB reduction to 20 ppb by carbon adsorption of PCB and reduction to 5 ppb when filtration follows carbon treatment.

Muriatic acid after carbon treatment has residual PCB content about 3.5 ppb.

Carbon treatment and filtration have permitted reduction in PCB content of tank car washes from about 50,000 ppb to 7 ppb.

C. Waste Treatment Pilot Plant

Pilot data indicate reduction as follows. Average of two runs.

Influent	77 ppb PCB's
Lime treated	27 ppb
Sand filtered	22 ppb
Carbon treated	7 ppb

At this time there is no research in progress to permit removal of PCB from aqueous streams to values below the carbon removal capability of 5 ppb. Carbon treatment of all streams are not contemplated at this time.

IV. CURRENT PROGRAM

During the past four months PCB monthly average daily losses as measured at the Waste Treatment Plant in #/PCB/day are as follows:

	Waste Treatment Influent	Waste Treatment Effluent
December, 1971	12 lbs/day	5 lbs/day
January, 1972	13	11
February	47	9
March	24	8

It is believed the Waste Treatment Influent represents losses from the plant. In turn it is believed the major source of plant losses is the Aroclor department. Calculations and recent plant field data would indicate the major source of PCB to the sewer from the Aroclor department to be organics present in the HCl off-gas. This premise is the basis for the control program that has been developed by the PCB Task Force Committee that will permit control of PCB losses from the department, the incinerator and the Rip Track at an average daily loss of about 1 #/day in the fourth quarter of 1972.

The program for PCB loss control that has been developed by the PCB Task Force and is currently being implemented can be summarized as follows:

A. Department operational control - containment - and recovery of PCB's to-in-from department effluent streams. Currently in effect and consists primarily of:

   1. Off-gas temperature control and Brink's mist eliminator operational control.

   2. Settling basin operational control

   3. Depts. 246-217 production coordination

   4. Drip pan-bucket control of minor leaks

   5. Dry clean-up procedure in place of profuse water cleaning of area.

B. HCl off-gas and air blow scrubbing projects. Calculations and field sampling would indicate losses of 14 to 31 # PCB's/day can be present in the off-gas leaving the department.

IV. CURRENT PROGRAM

B. (continued)

It is believed we can reduce this quantity by 95% by additional scrubbing of the off-gas. Laboratory work is in progress to verify, and then a project will be prepared. Estimated costs of $30,000 - $50,000.

C. Modifications to existing tank car wash procedures at Repair Track to permit limiting PCB in wash water to about 400 ppb. This is equivalent to about 0.02 #/PCB/day when tank cars are washed.

D. Complete current project work

1. Settling basin modification to permit improved separation of PCB from department Effluent discharge.

2. Major repair to main sewer from department to eliminate cross flow of ground water and permit improved sampling and flow measurements of department Effluent discharge. A $50,000 project.

The current program should permit us to reduce PCB loss to the sewer to about 1 #/day from those areas where PCB contamination is a possibility. Namely the Aroclor production department, the Incinerator and the Repair Track. 1 #/day would be equivalent to 13 ppb from WGK plant assuming 6400 GPM total effluent flow from plant. Any reduction in water flow from the plant to reduce costs of Secondary Waste Treatment would result in increase in PCB content above 13 ppb.

It is also conceivable and highly probable that residual PCB in WGK soils will continue to be leached for months to come. It is estimated this amount could approach the equivalent of 5 #/day average (65 ppb at 6400 gpm flow). This amount would show up in WGK Effluent streams.

V. COSTS

	Δ COST
A. Department and off-gas system could be contributing about 30 # PCB/day.	
B. Program to get to about 1 #/day ≃ 13 ppb from plant exclusive of residue PCB's in the total WGK ground system.	$100,000 major projects $100,000 minor projects, analysis, research and additional technical effort. Possibly $20,000/year operating costs.

V. COSTS (cont'd)

	COSTS
C. Program to get to 5 ppb ≃ 0.01 #/day by carbon treating Dept. 246 Effluent of 200 GPM.	Costs not known at this time.
D. Program to get to 5 ppb ≃ 0.4 #/day by carbon treating total plant Effluent.	Costs not known at this time.
E. No process known to get below 5 ppb PCB in Effluent streams.	Costs not known at this time.

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