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Monsanto

APR 14 1971

FROM (NAME & LOCATION): W. B. Papageorge - St. Louis

DATE: April 14, 1971

SUBJECT: PCB ENVIRONMENTAL PROBLEM
MARCH STATUS REPORT

REFERENCE:

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GENERAL:

The American National Standards Institute (ANSI) has formally approved the formation of a committee composed of representatives of the transformer and capacitor manufacturers, utilities, major industry, Monsanto and governmental regulatory agencies to develop policy, standards and guidelines for the proper use, disposal and control of polychlorinated biphenyls in transformers and capacitors. Monsanto has been requested to chair the group.

MARKETING:

No new developments reported.

ENGINEERING:

CEA 2415 - Incineration - WGK

All equipment except the oxidizer is set and the final piping installation work is in progress. A shortage of Brickmasons in the plant necessitated calling in an outside contractor to put refractory in the oxidizer. This work is to start April 12. Project completion by early May is contingent on completing the refractory work.

Considerable difficulty has been experienced in setting equipment from Zink but WGK construction forces are doing an outstanding job getting things together.

CEA 2417 - MCS 1016 - WGK

Construction progress has been good. All equipment is set. The column was set March 11. Piping drawings are now in the field and this work is moving well.

Because of manpower adjustments in the WGK plant to improve economics, it is anticipated that project completion will move to the middle of July. It is still felt that the column system will be ready for operation in June.

A variance is currently being developed to add facilities for producing monochlorobiphenyl. This variance will be designed, if approved, during the month of April.

CEA 7817 - Disposal of PCB's on Solids

A meeting was held to review the projected costs for such a project. All engineering work has stopped pending a decision by the Business Group.

CEA 2451 - NC Phosphate - JFQ

The capital estimate and scope report were completed and issued. The Appropriation Request Data Transmittal was submitted.

Design is moving rapidly. All preliminary engineering flow diagrams have been completed and equipment specifications are being prepared.

With the desire of the Business Group to produce 200M pounds of material in June, some elements are being expedited to support that run. This part of the design is complete and drawings are being reviewed.

JAPAN:

No new developments reported.

EUROPE:

1. Sales to non-controllable applications in the U.K. ceased on 1 March.

2. Interview given to Jon Tinker, Environmental Correspondent of New Scientist, on PCB problem and Monsanto reaction to it. Publication anticipated on Thursday, 1 April.

3. U.K. press comment on PCB situation has been slight, but the dumping of sewage sludge, containing PCB, into the Irish sea has attracted occasional comment. The report of the Royal Commission on Environmental Pollution has suggested that disposal of toxic chemicals at sea should be the subject of a special study.

MONS 099400

4. Technical discussion with NCR (UK) disclosed that Wiggins Teape would not accept MIBP for toxicilogical reasons. HB-40 is acceptable, but some functional improvement is looked for.

MEDICAL:

The final reports on the acute toxicity of Aroclor 1221, Aroclor 1542, and MCS 1016 were received from Industrial Bio-Test Laboratories. Attached is a table showing the data pertained. The results confirm the least toxic nature of the chlorinated triphenyls. (Page 4)

All other studies are progressing on schedule with the fish toxicity studies still being deferred until availability of appropriate test species.

PUBLIC RELATIONS:

Background material was furnished corporate officers in anticipation of PCB questions at the 1970 Annual Meeting. None were asked.

D. J. Forrestal, director, public relations, reported to the Board in March on "PR and the environmental scene." PCB and the division's effort to maintain a reasonably calm public profile, was part of the presentation.

Chemical Week requested an interview, via public relations, to prepare a feature story on Monsanto's PCB environmental program. The interview was conducted on March 18. Photos were provided. The article should appear soon.

TABLE I

Results

Test	Aroclor 1221	Test Material Aroclor 5442	MCS 1016
Acute Oral Toxicity Study - Albino Rats	LD_{50} = 2.0 g/kg	LD_{50} = 8.4 g/kg	LD_{50} = 6.8 g/kg
Acute Dermal Toxicity Study - Albino Rabbits	LD_{50} = 5.0 g/kg	LD_{50} > 10.2 g/kg	LD_{50} = 6.0 g/kg
Eye Irritation Test - Albino Rabbits	Minimally Irritating (8.0/110.0)	Non-Irritating (0.0/110.0)	Non-Irritating (0.0/110.0)
Primary Skin Irritation Test - Albino Rabbits	Moderately Irritating (3.8/8.0)	Moderately Irritating*	Moderately Irritating (4.0/8.0)

* Aroclor 5442 could not be removed from the test sites at 24 hours. By 72 hours, red, well-defined erythema and moderate to severe edema of the skin at the site of contact were noted.

MONS 099402

RESEARCH:

Aroclor Environmental Program

An analytical program covering the analysis of tissues and materials from toxicity work at Industrial Bio-Test the past year was started on March 15. A two man continuous effort is being directed toward establishing polychlorinated biphenyl residues for correlation with toxicity data from animal studies.

Analyses confirmed that a bakery by-product meal from Agway contains about 750 ppm polychlorinated biphenyl typical of Aroclor 1248. The source of the PCB is unknown.

Gravimetric and GC analyses showed that residual Aroclor 1242, 1254 and 1260 can be satisfactorily removed from used drums at Evans Steel Drum Company, Inc. via kerosene washes. The washes would be shipped to WGK for incineration.

Biodegradation Testing Program - St. Louis

Results from the last sampling period show that replacement product MCS 1043, which is free of 4, 5 and 6 chlorine isomers, degrades at about twice the rate (56% in 48 hours) of MCS 1016 and Aroclor 1242. The semi-continuous activated sludge technique is not sufficiently reproducible to show small degradation differences between MCS 1016 and Aroclor 1242 per se. Accordingly, we plan to obtain a degradation rate for the high boilers separated from Aroclor 1242 by distillation. This information should allow us to show that MCS 1016 is an improved product more free of non-biodegradable components found as residues in the environment.

The degradation rate for Arobromoclor 1232 appears to be the same order of magnitude as that for MCS 1043.

Data for the above are based on the disappearance of the aromatic ring structure as measured by ultraviolet absorption spectroscopy. An eight week statistical study of the biodegradation test variables shows that higher and more uniform degradation figures are obtained using 48 hour test cycles (instead of 24 hour), relatively low sludge levels and high feed levels of test materials.

Biodegradation - Ruabon

The development of analytical techniques for identification and quantification of degradation residues has progressed.

Using a 500 ft capillary column we have shown separation of practically all isomers in Aroclor 1242 and MCS 1016 and we believe that fairly accurate quantification of degradation residues may now be possible.

It has been confirmed that significant degradation of 4,4'-dichlorobiphenyl has occurred with the biphenyl active culture, C_3. Work is continuing to explore the extent of degradation possible with cultures C_2 and C_3.

Aroclor Removal by Carbon Adsorption - Anniston

A PR&D Report on this study will be issued by 3/24.

Reactor-Clarifier Study - Anniston

Prior to 3/8 the unit had to be shut down intermittently due to freezing weather. No useful data was obtained during this period since the unit was not operated long enough at a time to reach equilibrium. Since that time, however, the unit has been operating smoothly. Not enough data exist at this time to draw any conclusions as to the efficiency of the operation in removing solids and Aroclor.

MANUFACTURING:

PCB Levels in Sewer

Aroclor losses for the month of February averaged 31 pounds per day and through March 25 decreased to 20 pounds per day. The high treatment plant numbers for March 25 resulted from removing the sludge from the treatment plant settling basins.

Program to Eliminate Sewered PCB's From Using Departments

A. Therminol unit change-outs

Dept.	
255	Complete
222 ONA	Complete
222 PNA	Dept. shutdown. Will drain unit by mid-April
244	Complete
243 (4 units)	Will change out first unit week of 4/5 and will complete all units by 5/1.
270, 275, 258	All units on schedule to be changed out by 5/1. Change-out is a must before turning over these departments to Edwin Cooper.
239	Scheduled for mechanical completion by 5/15.
248 (2 units)	Scheduled for mechanical completion by 5/1.
273	Scheduled for mechanical completion by 5/15.
245	Decision made to convert to Therminol 66. Change-out should be completed by 6/1.

B. Pydraul A-200 has been replaced with A-200B in one centrifuge and the compactor systems in Dept. 251. The second centrifuge system should be changed out early in May.

C. All Aroclor trailers are being washed at WOK Rip Track. A project is being developed to allow washing cars and trailers with kerosene. This will allow incinerating the first wash.

D. A system has been installed in Dept. 218 to drum liquid caught in the catch tank on the HCl header. This liquid, formerly sewered, contains PCB's.

Current Level

Aroclor losses during March 1971 averaged 5.22 lbs/day (515 ppb).

The breakdown of the number is:

26 Day average	88 ppb	0.89 lbs/day
Increase due to cleaning out the warehouse	427	4.33
Total:	515 ppb	5.22 lbs/day

Projects and Evaluations

1. Limestone added to No. 1 neutralization pit. Unit is now ready for startup.

2. Repairs to 36" sewer under Aroclor Building (Bldg. 27) and Warehouse are complete. Samples from 36" sewer awaiting analysis to determine completeness of sealing.

Spills

There were no spills of Aroclor in March 1971.

W B Papageorge

W. B. PAPAGEORGE

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