H. S. BERGEN - ST. LOUIS

OCTOBER 30, 1969

EXECUTIVE SUMMARY
PCB POLLUTION

C. J. SMITH
T. K. SMITH

The attached was prepared in case General Management wants it and also to briefly summarize the situation.

H. S. BERGEN

ms

Attachment

EXHIBIT
WBP M-40

10/29/69

EXECUTIVE SUMMARY

PCB POLLUTION

COMPANY CONFIDENTIAL

PROBLEM:

Contamination of the environment with polychlorinated biphenyls (PCB) (Aroclor products).

PROBLEM DEFINITION AND TIMING:

Professors Widmark and Jensen of the Institute of Analytical Chemistry at Stockholm, Sweden, in November 1966, announced and confirmed finding PCB in fish, birds, and eggs. Subsequent findings were made in 1967 in Great Britain. Problem was first presented in the U.S. by Professor Risebrough of the University of California in a published article in the San Francisco Cronicle in February, 1969. Monsanto confirmed the presence of PCB's in mid-1969 and confirmed the adequacy of work by Widmark and Jensen and others — a worldwide ecological problem.

CONFIRMATION OF FINDINGS:

Analysis indicates environmental presence of 5 and higher chlorinated biphenyls (similar to Aroclors 1254 and 1260). Other Aroclors may contribute, but have not been identified yet. In the last six months, PCB's have been reported present in waters in Lake Michigan, fish in Connecticut, seafood along the Gulf Coast, and waters outside Monsanto plants.

SERIOUSNESS OF PROBLEM:

1. Fish - Marine or aquatic species concentrate PCB in the fatty tissue. Toxic in small quantities (down to 5 ppb) to sensitive marine life such as shrimp.

2. Birds - Predatory species feeding on the marine or aquatic life can further concentrate PCB to possible harmful effects. Specifically in birds, PCB can effect the calcium metabolism leading to egg shell imperfections which prevents proper hatch of the young.

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3. Man - There is no harmful effect known to man or other mammals after 40-years of production. Studies are underway by various sources.

4. Political and Public Emotion - PCB's linked to DDT because PCB's show up in analyses for DDT. Linked with other permanent chlorinated hydrocarbon pesticides.

EFFECT ON MONSANTO:

1. Business potential at stake on a worldwide basis:

Fluids	Plasticizers	Total/Year
70 M Lbs.	34 M Lbs.	104 M Lbs.
$16 M	$6 M	$22 M
$6-8 M GP	$2-3 M GP	$8-11 M Gross Profit

2. Legal responsibility.

3. Public image.

4. Effect on other product areas.

EFFECT ON CUSTOMERS AND ULTIMATE CONSUMERS:

1. Affects entire electrical industry - capacitors and transformers.

2. Affects food processing.

3. Affects die casters and other "hot metal" working industries.

4. Affects wide range of plastics and adhesive applications.

5. Affects wide range of paints and coatings.

EFFECT ON OTHER PRODUCERS:

There are at least six other producers of PCB's ex-USA. Monsanto has discussed problem with two in Europe. No great concern there yet.

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MAIN SOURCES OF POLLUTION:

Difficult to define, but Aroclor 1254 and 1260 are used in electrical devices, heat transfer, plastics, adhesives, coatings, and industrial fluids. Other Aroclors contain minor percentages of 5 and 6 chlorine ring structures. Manufacturing plants also a vulnerable contributing factor, but less significant in quantity than customer or end user loses.

POSSIBLE CONTROL OF CONTAMINATION:

- Electrical and heat transfer - possible to control with effort and reclamation.
- Industrial fluids, plastics, coatings and adhesives - very difficult, if not impossible to control. Substitute products needed.

MONSANTO OUTSIDE STATEMENTS:

- Letter sent to electrical customers regarding problem.
- Monsanto Public Relations statement attached.

MONSANTO FUTURE ACTION:

Presentation to CDC reviewing subject and future plan of action by November 17, 1969. This will define a program to determine what is necessary in various product areas to meet the problem.

1. Research and Engineering needed and cost.
2. Plant and customer "clean-up and control" required and cost.
3. Biodegradability of Aroclors.

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4. Toxicity studies.

5. Alternative routes.

6. Recommended approach.

7. Appropriation request to cover capital and expenses required.

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