Analytical Chemistry
Special Study 70-21
Job No. 13480/16300

AROCLOR DEFENSE - 1970 PCB SUPPORT ANALYSIS

INTRODUCTION

In the past year, in addition to the analysis of the numerous samples generated by internal Organic Division research on Aroclor and Aroclor substitutes, several hundred assorted types of samples have been analyzed for PCB's. The results of these analyses have been used by both Monsanto and its customers to: (1) identify, locate, and assess the magnitude of Aroclor pollution problems, (2) help determine what needs to be done to control the pollution source(s), (3) verify that the proposed pollution control procedure(s) is (are) effective, and (4) develop methods of reclamation for recycle and/or safe destruction of Aroclor wastes.

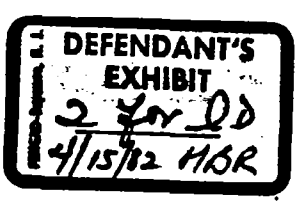
The objective of this special study report is to consolidate this information for ease of reference as well as provide a general over view of the findings.

SUMMARY

The attached table summarizes results of the work done during 1970 on the detection of PCB's in environmental materials. It covers a total of 486 samples which were analyzed during 1970. PCB's typical of our Aroclor products were found in

- Water and sediment from 4 manufacturing sites, 13 customer sites, 12 U.S. rivers, 1 U.K. river and Lake Michigan.
- Air at the Anniston Plant and at the Appleton Coated Paper Co.
- Fish from Lake Michigan and 8 U.S. rivers.
- Human fat from a midwest biopsy specimen.
- Milk from Maryland, Ohio, and Massachusetts dairy farms.
- Shrimp from Escambia Bay, Florida.

The air, water, and sediment samples contained materials most typical of Aroclor 1242, 1248, 1254 and/or 1260. The milk,



HARTOLDMON0013026

shrimp, and fish samples most often contained PCB's typical of Aroclor 1254-Aroclor 1260.

RESULTS

See attached table.

Monsanto Company
Organic Chemicals Division
Applied Sciences Section
St. Louis, Missouri

2/71 - E. S. Tucker

11414

HARTOLDMON0013027

Location of Manufacturing or User Site	Associated Waterway(s)	Sample Matrix	No. of Samples
Industrial			
Monsanto, U.S.A. W. G. Krummrich Plant Sauget, Ill.	Mississippi River	Water	69
		Sediment	12
		Fish	17
		Muriatic Acid	9
J. F. Queeny Plant St. Louis, Mo.	Mississippi River	Water	6
		Fumaric Acid	2
		Saccharin	5
Delaware River Plant Bridgeport, N. J.		Phthalic Anhydride	5
Pensacola Plant Pensacola, Florida	Escambia Bay and River	Water	7
		Fish	1
		Shrimp	4
Anniston Plant Anniston, Ala.	Snow Creek Choccolasso Creek Coosa River	Water	26
		Sediment	5
		Fish	35
		Hog Fat & Liver	2
Monsanto, U.K. Newport, England	River Severn (Uskmonth Area)	Sediment	4
National Cash Register Portage, Wisconsin	Fox and Wisconsin Rivers	Water	12
Appleton Coated Paper Co. Appleton, Wisc.	---	Air	10
		Water	
General Motors Corp. Central Foundry Div. Bedford, Ind.	---	Water	13
General Motors Corp. Pontaic Div. Pontaic, Michigan	---	Mold Sand	1
Ford Dearborne, Michigan	---	Mold Sand	2
Johnson Motors Waukegan, Ill.	Lake Michigan	Water	4
Wisconsin Steel Chicago, Ill.	Chicago Metro Sewer	Water	3

HARTOLDMON0013028

1242	1248	1254	1260	PCB Level	Support Objective
X	X	X	X	ppb-ppm	Plant Pollution Cont
X	X	X	X	ppb-%	"
X	X	X		ppm	"
X				ppb	"
X				ppb	"
				None Detected	"
				"	"
X	X			ppb	"
		X		ppb	"
		X		ppm	"
		X		ppb	"
X	X	X		ppb-ppm	"
X	X	X		ppb-ppm	"
	X	X		ppb-ppm	"
X		X		%	"
X				ppb-ppm	"
X				ppm	Customer Service
X				mg/m^3	"
X	X			ppm	"
X				ppm	"
X				ppm	"
X				ppm	"
X				ppm-%	"

HARTOLDMON0013029

Location of Manufacturing or User Site	Associated Waterway(s)	Sample Matrix	No. Sample
Wheeling Pittsburgh Steel Steubenville, Ohio	Ohio River	Water	1
		Sediment	1
Lester Coating Co. Bedford, Ohio	Storm Sewer	Water	1
Central Diecasting Chicago, Ill.	Downtown Sanitary Sewer	Water	2
Timken Bearing Canton, Ohio	---	Water	3
U.S. Steel Christy Park	---	Water	1
JARD Co., Inc.	---	Water	6
General Electric Pittsfield, Mass.	---	Water	15
Non-Industrial Organization Supplying Sample	**Sample Source**		
Wisconsin Alumin Res. Foundation Institute, Inc.	Manitowoc River Wisc.	Fish Composite	1
	Kewaunee R. Wisc.	Fish Composite	1
	Burns Ditch Lake Mich.	Fish Composite	1
	Manistee R. Mich.	Fish Composite	1
	Unknown Source	Human fat biopsy sample	1
State of Ohio Dept. of Agriculture Food, Daires, and Drug Laboratories	Dairy Farms	Silo Scraping	1
		Milk Extract	1
		Raw Milk	3
Maryland Cooperative Milk Producers, Inc.	Coop Dairy Farms	Milk	5
		Water	4
Misc. Support Work			
Bio-Test Laboratory Tissue Studies	---	Rats	48
		Chickens	36
		Fish & Water	40
John Zinc Co. Tulsa, Oklahoma	---	Gas Scrubber Samples	49
Monsanto Enviro-Chem St. Charles, Mo.	---	"	3
		Water 11417	4
		Sediment	4
Monsanto Inorganic Division	---	NTA	8

HARTOLDMON0013030

PCB's Found Most Typical of Aroclor					
1242	1248	1254	1260	PCB Level	Support Objective
X				ppm	Customer Service
X				ppb	
X				ppm	"
X				ppb-ppm	"
X				ppb	"
X				ppm	"
X				ppb	"
		X	X	ppb	"
		X		ppm	Colaborative Analysis
		X		ppm	"
		X		ppm	"
		X		ppm	"
		X		ppm	"
		X		%	
		X		ppm	
		X		ppm	
				ppb	
				None Detected	
X	X	X		ppm-%	Residue Research on Synthetic Samples
X		X	X	ug/m^3-mg/m^3	Waste Incineration
X				mg/m^3	"
X				ppb	"
X				ppb	11418
				None Detected	Divisional Service

HARTOLDMON0013031