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ANALYTICAL

TYPE OF REPORT

REPORT

REPORT NO.: MDA-421

JOB PROJECT NO.: 483.5450

DATE: November 7, 1983

PERIOD COVERED:

TITLE: ANALYSIS OF WATER AND SEDIMENTS FOR PCB'S

AUTHORS: B. M. Hughes

ABSTRACT: Water and sediment samples from Monsanto PTF were analyzed for their possible PCB contaminations. The results of these analyses are shown in this report.

Technical Approval

Joseph J. Brooks
J. J. Brooks
Research Group Leader

Approved by:

Robert F. Ivory
Robert F. Ivory
Environmental Sciences Center
Service Project Manager

Approval date:

11-11-83

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MONS 022665

AUTHORS: B. M. Hughes
TITLE: ANALYSIS OF WATER AND SEDIMENTS FOR PCB'S

REP. NO.: MDA-421

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ACKNOWLEDGEMENT

Contributions of the following Dayton Laboratory personnel to this project are gratefully acknowledged:

Analyses: B. M. Hughes
D. McKenzie
C. Trang

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MONS 022666

ANALYSIS REPORT

DATE: 11/2/83

LOG NUMBER: 1-83-10-28-01

PROJECT NO: 483.54518

TO:

RTP/Hughes

FROM:

Environmental Sciences Center
Monsanto Research Corporation
1515 Nicholas Road
Dayton, Ohio 45413

Phone No: (513) 268-3411

Title: Analysis of PCBs in Two Water Samples and Four Sediment Samples

Standard Sampling Method No(s): N/A

Standard Extraction Method No(s): PCEX02, WSEX01

Standard Analysis Method No(s): ECAN02

Final Report File No(s): A54518

Table File No(s): E54518, C54518, D54518

See Tables 1 - 3 for results using the above referenced Standard Extraction and Analysis Methods.

ANALYST(S): B. M. Hughes, D. McKenzie and C. Trans

ANALYST APPROVAL: *B. M. Hughes*

MONS 022667

Table B. Results of CHLORINE OC/PC Analysis of ~~CHLOR~~ Sediment Samples

ESC Project No. 483.54518

Date: November 1, 1980

SAMPLE IDENTIFICATION

Method Blank	102583-1R	102583-1R Duplicate
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ANALYTE	ESC ANALYTICAL METHOD	LOD		CONCENTRATION (ug/g)	
Aroclor 1248	ECAN02	1.0	ND	ND	ND
Aroclor 1254	ECAN02	1.0	ND	1.03	1.9
Aroclor 1260	ECAN02	1.0	ND	ND	ND
Total Aroclors	ECAN02	1.0	ND	1.03	1.9

SURROGATE SPIKING COMPOUND		AMOUNT ADDED (ug/g)		RECOVERY (%)	
CL5-benzene	ECAN02	1.0	95	66	66

DOCUMENTATION

ESC Extraction Method	PCEX02	PCEX02	PCEX02
Sample Amt extracted (g)	0	1.0634	0.9365
Extract Final Volume (ml)	10	10	10
Extract Dilution	1:1	1:1	1:1
ESC Extract No.	FCB199	FCB201	FCB202
Process File Name	BP179	BP181	BP192

EXPLANATION OF ABBREVIATIONS:

LOD = limit of detection in ug/g

ND = none detected with a detection limit given by the LOD value

NA = not analyzed

TABLE FILE NO: B54518

MONS 022668

TABLE 2. SUMMARY OF QUALITY OF/EC ANALYSES OF RTP Sediment Samples

BSC Project No: 483.54518

Date: November 1, 1993

SAMPLE IDENTIFICATION					
		102583-2R	102583-3R	102583-4R	
ANALYTE	ESC ANALYTICAL METHOD	LOD	CONCENTRATION (ug/g)		
Aroclor 1248	ECAN02	1.0	ND	ND	ND
Aroclor 1254	ECAN02	1.0	ND	ND	ND
Aroclor 1260	ECAN02	1.0	ND	ND	ND
Total Aroclors	ECAN02	1.0	ND	ND	ND
=====					
SURROGATE SPINNING COMPOUND		AMOUNT ADDED (ug/g)	RECOVERY (%)		
CL5-benzene	ECAN02	1.0	41	67	15
=====					
DOCUMENTATION					
ESC Extraction Method		PCEX02	PCEX02	PCEX02	
Sample Amt. extracted (g)		1.1581	1.1243	1.0161	
Extract Final Volume (ml)		10	10	10	
Extract Dilution		1:1	1:1	1:1	
ESC Extract No.		PCB003	PCB004	PCB009	
Process File Name		EP183	EP184	EP180	
=====					
EXPLANATION OF ABBREVIATIONS:					
LOD = limit of detection in ug/g					
ND = none detected with a detection limit given by the LOD value					
NA = not analyzed					
=====					
TABLE FILE NO: CS4518					
=====					

MONS 022669

TABLE 1. Results of Capillary GC/EC Analyses of RTP Water Samples

ESC Project No: 483.54518

Date: November 1, 1983

SAMPLE IDENTIFICATION				
		Pond Water	Distilled Water	
ANALYTE	ESC ANALYTICAL METHOD	LOD	CONCENTRATION (ug/g)	
Aroclor 1248	ECAN02	.001	ND	ND
Aroclor 1254	ECAN02	.001	ND	ND
Aroclor 1260	ECAN02	.001	ND	ND
Total Aroclors	ECAN02	.001	ND	ND
=====				
SURROGATE SPLICING COMPOUND		AMOUNT ADDED (ug/g)	RECOVERY (%)	
CL5-benzene	ECAN02	.001	67	84
=====				
DOCUMENTATION				
ESC Extraction Method		WSEX01	WSEX01	
Sample Amt extracted (g)		1000	1000	
Extract Final Volume (ml)		1	1	
Extract Dilution		1:1	1:1	
ESC Extract No.		PCB205	PCB206	
Process File Name		BP148	BP146	
=====				
EXPLANATION OF ABBREVIATIONS:				
LOD = limit of detection in ug/g				
ND = none detected with a detection limit given by the LOD value				
NA = not analyzed				
=====				
TABLE FILE NO: 054518				

MONS 022670

The following pages describe Standard Extraction Methods and Standard Analysis Methods used for this project.

MONS 022671

ESC Standard Extraction Method (SEM)
TITLE: Non-EC Active Matrices

ESC Standard Extraction Method No.
PCEX02

MATRIX (X), (CES):

Soils and other non-EC active
solids and solvents

TYPICAL SAMPLE
SIZE
(g)

0.5 - 5.0

TYPICAL EXTRACT
VOLUME
(ml)

10

TYPICAL ANALYTES: Aroclors 1232,
1248, 1254, 1260, 1262; trichloro-
biphenyl isomers through octachloro-
biphenyl isomers

ESC Standard Analysis Method Nos.
ECAN01, ECAN02

INTERFERENCES: An. electron capturing
species in the retention time region
of trichlorobiphenyl isomers through
octachlorobiphenyl isomers.

TYPICAL
SURROGATES

TYPICAL
RECOVERIES (%)

pentachlorobenzene 50 - 120
2,4,6-trichloro-
biphenyl 50 - 120

APPARATUS AND MATERIALS:

Burdick and Jackson, benzene for sample extraction or dilution.
Disposable glassware.

LIMITATIONS: Method applies only to matrices which do not contain interfering
electron capturing species in the trichlorobiphenyl through octachloro-
biphenyl isomer retention time region.

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATES OF METHOD CREATION AND UPDATES: 10/31/83

**ESC Standard Extraction Method (SEM)
TITLE: Organic Compounds in Water**

**ESC Standard Extraction Method No.
MSX01**

MATRIX (X), (CES):

Water

**TYPICAL SAMPLE
SIZE
(g)**

**TYPICAL EXTRACT
VOLUME
(ml)**

1 - 4000

1 - 10

TYPICAL ANALYTES: Aroclors 1232, 1248, 1254, 1260, 1262, trichlorobiphenyl isomers through octachlorobiphenyl isomers, organic compounds eluting between toluene and n-C24-ane

**ESC Standard Analysis Method No.:
ECAN01, ECAN02, HSA001**

INTERFERENCES: Any electron capturing species in the retention time region of trichlorobiphenyl isomers through octachlorobiphenyl isomers for ECAN01 and ECAN02.

**TYPICAL
SURROGATES**

**TYPICAL
RECOVERIES (%)**

phenol-d5	20 - 80
CL-phenol-d4	20 - 80
CL2-benzene-d4	50 - 120
naphthalene-d8	50 - 120
pyrene-d10	50 - 120
chrysene-d12	50 - 120
pentachlorobenzene	50 - 120
2,4,6-trichlorobiphenyl	50 - 120

APPARATUS AND MATERIALS:

Burdick and Jackson methylene chloride for sample extraction.
Disposable glassware for sample sizes below 20 g and separator funnels for larger sizes. Larger sample sizes also require sodium sulfate columns for extract drying.

LIMITATIONS: Method applies only to matrices which do not contain electron capturing species in the trichlorobiphenyl through octachlorobiphenyl isomer retention time region for ECAN01 and ECAN02.

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATES OF METHOD CREATION AND UPDATES: 10/31/83

EPC Standard Analysis Method (SAM)
TITLE: Aroclor Formulations in Solvents

EPC Standard Analysis Method Not
EPC02

ANALYTICAL INSTRUMENT AND MODE OF OPERATION: HP-5890 Capillary GC/EC Inter-
faced to an HP-3354-LAS Laboratory Data System

TYPICAL ANALYTE	TYPICAL INSTRUMENT LEVEL OF DETECTION (LOD) (ug/ml)	TYPICAL PRECISION @ 10X LOD (%)	TYPICAL ACCURACY @ 10X LOD (%)
Aroclor Formulations 1212, 1248, 1254, 1260 and 1260	0.1	20	30

INTERFERENCES AND LIMITATIONS: Any electron capturing species in the reten-
tion time region of trichlorobiphenyl through octachlorobiphenyl isomers
are potential interferences. Exact retention times of most likely PCB isomers
can be obtained from the analysis of Aroclor 1248, Aroclor 1254 or Aroclor
1260 formulations.

CHROMATOGRAPHIC COLUMN: 30-meter fused silica J&W DB-5 (0.25 μ m) with
113 μ bore (0.32mm).

COLUMN TEMPERATURE PROGRAM: 130(1)/4/300

INJECTION TYPE: Splitless

CALIBRATION AND STANDARDIZATION: Use internal standard quantitation technique
and calibrate instrument response factors from authentic Aroclor formulation
standards. Use a minimum of 10 PCB isomers for the determination of formu-
lation identity and quantity.

CALCULATIONS: Formulation concentration = (isomer area)/(isomer RRF)

where: RRF is the relative response factor for the appropriate
PCB isomer in a given formulation. Formulation concentra-
tion is obtained from the average of at least 10 such cal-
culations.

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATES OF METHOD CREATION AND METHOD UPDATES: 10/25/83

MONS 022674