



# United States Department of the Interior

TAKE  
PRIDE IN  
AMERICA

FISH AND WILDLIFE SERVICE  
Bishop Henry Whipple Federal Building  
1 Federal Drive  
Fort Snelling, MN 55111-4056

IN REPLY REFER TO:

FWS/AES-EC

AUG 31 1994

8930007.1

on-ry

## Memorandum

To: Superfund Project Coordinator, Marion (MISO)  
From: Chief, Division of Environmental Contaminants (EC)  
Subject: Report of Analytical Results from Fish and Salvaged Eaglets: Study ID 89-3-100

Attached please find the subject results. These results are for fish that were collected from Crab Orchard Lake and are cross-checks with Illinois EPA. This memorandum report also contains the results of chemistry from two eaglets that were salvaged as the result of them apparently falling from the nest located at Grassy Bay (a bay of Crab Orchard Lake).

First, the results from the fish indicate that fillets from three of ten exceed the FDA action level. Two of the others probably could not be statistically differentiated from the two parts per million concentration that is the FDA action level for PCBs in fish. Therefore, 50 percent of these fish meet or exceed the FDA action level and some type of consumption advisory is probably warranted on Crab Orchard Lake.

Second, the results for the eaglets is a little surprising in light of the fish concentrations. With a nest as close to Crab Orchard Lake as this one, I would expect to find quite high PCB concentrations, but that is not what the data indicate. These PCB concentrations are not much different than we see in inland populations that are supposedly removed from sources of high concentrations of PCBs. These concentrations are vastly lower than concentrations from the Great Lakes shoreline nests where Grassy Bay forage fish concentrations are lower than the fish concentrations in fish from Crab Orchard Lake.

This suggests to me that the adult eagles did not feed fish from Crab Orchard Lake to their young during this breeding season. If the adults were feeding fish from Crab Orchard Lake to their young, it is my opinion that the concentrations in these young birds would be much higher. The birds do show exposure to PCBs, but the exposure is relatively low. There is really nothing that can be done about this situation to assure that the birds don't start feeding Crab Orchard Lake fish to their young except to continue with the PCB cleanup as quickly as we can.

I hope you find this report useful. Please call if you have any questions.

*T.J. Miller*  
T.J. Miller

001.91f

Attachment

APT 147

2.

U. S. FISH AND WILDLIFE SERVICE  
PATUXENT ANALYTICAL CONTROL FACILITY

QUALITY ASSURANCE REPORT

RE: 5850

REGION: 3

REGIONAL ID: 89-3-100A

THE ANALYSES ON THE ABOVE MENTIONED SAMPLES WERE PERFORMED AT:

TEXAS A & M RESEARCH FOUNDATION  
10 SOUTH GRAHAM RD  
COLLEGE STATION, TX 77840

AFTER A THOROUGH REVIEW OF THIS REPORT, I REPORT THE FOLLOWING OBSERVATIONS  
AND CONCLUSIONS:

THE ACCURACY, AS MEASURED BY SPIKE RECOVERY ANALYSIS, WAS GENERALLY  
ACCEPTABLE. RECOVERIES OF ALPHA BHC, BETA BHC, DELTA BHC, AND HCB IN  
TISSUES HAVE AVERAGED LESS THAN 80 %. THE METHOD SHOULD NOT BE CONSIDERED  
QUANTITATIVE FOR THESE ANALYTES. THE ATTACHED TABLE CONTAINS THE AVERAGE  
SPIKE RECOVERIES FOR ORGANOCHLORINES IN TISSUES.

THE PRECISION, AS MEASURED BY DUPLICATE SAMPLE ANALYSIS, WAS ACCEPTABLE.

WE HAVE NOT RECEIVED SUFFICIENT DATA FROM THIS LABORATORY TO ESTIMATE  
CONFIDENCE INTERVALS.

*Clifford P Rice* 2-20-90 002.gif  
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QUALITY ASSURANCE OFFICER      DATE

TABLE 1: AVERAGE RECOVERY OF SPIKED ANALYTE FROM TISSUES ANALYZED  
BY THE GEOCHEMICAL AND ENVIRONMENTAL RESEARCH GROUP  
TEXAS A&M UNIVERSITY

ANALYTE	AVERAGE	STANDARD DEVIATION	NUMBER
alpha BHC	74.6	21.3	42
HCB	59.7	25.5	21
beta BHC	79.3	21.9	42
delta BHC	41.5	36.1	42
Heptachlor	86.9	23.9	44
Aldrin	101.7	11.3	44
Heptachlor epoxide	106.9	13.2	44
gamma Chlordane	94.4	8.3	21
alpha Chlordane	110.1	22.3	21
trans Nonachlor	107.5	7.4	21
Dieldrin	101.3	13.5	44
Endrin	86.9	12.0	7
Mirex	102.9	9.6	18
o,p' DDE	108.0	11.1	20
p,p' DDE	106.5	15.1	44
o,p' DDD	85.9	24.1	21
p,p' DDD	96.2	18.9	44
o,p' DDT	106.7	8.7	21
p,p' DDT	95.2	21.8	44
Total PCB	103.6	18.7	52

ANALYTICAL REPORT INTEGRITY FORM

Catalog #: 5050      Lab: TAM      Region: 3

☒ Initial QA/QC Review -- Report Correct

[illegible]



5  
**CATALOG #5850**

**SAMPLE ANALYSES RESULTS**

**for**

**U.S. Fish and Wildlife Service**

**Prepared by**

**Geochemical and Environmental Research Group  
Texas A&M University**

**FEBRUARY 8, 1990**

**received**  
**2-9-90**

FISH & WILDLIFE SERVICES - CATALOG # 5850  
BULK PARAMETERS

FILE	FWS SAMPLE ID	SAMPLE TYPE S,F,B,W	COMMENTS/DESCRIPTION	SAMPLE WT. (gr)	% MOISTURE	% LIPID
F3012	DO 67764	F	largemouth bass	10.19	67.99	6.10
F3013	DO 67765	F	carp	10.46	64.51	9.94
F3014	DO 67766	F	largemouth bass	10.33	71.18	3.70
F3015	DO 67769	F	channel catfish	10.16	64.85	11.77
F3016	DO 67771	F	carp	10.37	60.91	15.15
F3017	DO 67774	F	channel catfish	9.90	68.37	13.22
F3018	DO 67775	F	carp	10.35	60.54	13.96
F3019	DO 67784	F	channel catfish	9.97	78.61	3.16
F3020	DO 67786	F	largemouth bass	10.30	70.32	5.66
F3021	DO 67794	F	channel catfish	10.29	74.60	5.15

\* All data on a wet weight basis

FISH & WILDLIFE SERVICES - CATALOG # 5850  
AROCOR DISTRIBUTION

FILE	FWS SAMPLE ID	SAMPLE TYPE S,F,B,W	COMMENTS/DESCRIPTION	SAMPLE WT. (gr)	% PCB 1254	% PCB 1260
F3012	DO 67764	F	largemouth bass	10.19	99	1
F3013	DO 67765	F	carp	10.46	98	2
F3014	DO 67766	F	largemouth bass	10.33	97	3
F3015	DO 67769	F	channel catfish	10.16	99	1
F3016	DO 67771	F	carp	10.37	98	2
F3017	DO 67774	F	channel catfish	9.90	98	2
F3018	DO 67775	F	carp	10.35	98	2
F3019	DO 67784	F	channel catfish	9.97	99	1
F3020	DO 67786	F	largemouth bass	10.30	99	1
F3021	DO 67794	F	channel catfish	10.29	98	2

\* All data on a wet weight basis

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## FISH &amp; WILDLIFE SERVICES - CATALOG No 5850 - PESTICIDE &amp; PCB ANALYSIS

RAW FILE#	DESCRIPTOR	ALPHA- BHC (ppm)	HCB (ppm)	BETA- BHC (ppm)	GAMMA- BHC (ppm)	DEL- BHC (ppm)	TOTAL BHC'S (ppm)	HEPTA- CHLOR (ppm)	ALDRIN (ppm)	HEPTA- EPOXIDE (ppm)	OXY- CHLORDANE (ppm)	GAMMA- CHLORDANE (ppm)	ALPHA- CHLORDANE (ppm)	TRANS- NONACHLOR (ppm)
F3012P	DO 67764	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
F3013P	DO 67765	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.01	0.05	0.04	0.05
F3014P	DO 67766	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
F3015P	DO 67769	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.02
F3016P	DO 67771	<0.01	<0.01	0.09	<0.01	<0.01	0.09	0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02
F3017P	DO 67774	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.02
F3018P	DO 67775	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	0.03	0.05	0.04
F3019P	DO 67784	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
F3020P	DO 67786	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
F3021P	DO 67794	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01

\* Confirmed by GC/MS

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## FISH &amp; WILDLIFE SERVICES - CATALOG No 5850 - PESTICIDE &amp; PCB ANALYSIS

RAW FILE#	DIELDRIN (ppm)	ENDRIN (ppm)	CIS- NONACHLOR (ppm)	MIREX (ppm)	2,4' DDE (O,P' DDE) (ppm)	4,4' DDE (P,P' DDE) (ppm)	2,4' DDD (O,P' DDD) (ppm)	4,4' DDD (P,P' DDD) (ppm)	2,4' DDT (O,P' DDT) (ppm)	4,4' DDT (P,P' DDT) (ppm)	TOTAL PCB'S (ppm)	TOXA- PHENE (ppm)
F3012P <i>LM</i>	0.02	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.01	2.34	<0.10
F3013P <i>C</i>	0.03	<0.01	0.02	<0.01	<0.01	0.02	<0.01	0.01	0.01	0.01	*2.97	<0.10
F3014P <i>LM</i>	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.48	<0.10
F3015P <i>CC</i>	0.02	<0.01	0.02	<0.01	<0.01	0.04	<0.01	<0.01	0.01	<0.01	1.94	<0.10
F3016P <i>C</i>	0.02	<0.01	0.01	<0.01	<0.01	0.06	<0.01	0.01	0.01	0.02	1.92	<0.10
F3017P <i>CC</i>	0.02	<0.01	0.02	<0.01	<0.01	0.06	<0.01	<0.01	<0.01	0.01	1.60	<0.10
F3018P <i>C</i>	0.03	<0.01	0.03	<0.01	<0.01	0.06	<0.01	0.01	0.02	<0.01	*3.72	<0.10
F3019P <i>CC</i>	0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.01	1.02	<0.10
F3020P <i>LM</i>	0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	1.50	<0.10
F3021P <i>CC</i>	0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	0.45	<0.10

\* Confirmed by GC/MS

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**CATALOG # 5850**

**QUALITY ASSURANCE/QUALITY CONTROL  
(QA/QC)**

**for**

**U.S. Fish and Wildlife Service**

**Prepared by**

**Geochemical and Environmental Research Group  
Texas A&M University**

**FEBRUARY 8, 1990**

FISH & WILDLIFE SERVICES - CATALOG # 5850  
BULK PARAMETERS

FILE	FWS SAMPLE ID	SAMPLE TYPE S,F,B,W	COMMENTS/DESCRIPTION	SAMPLE WT. (gr)	% MOISTURE	% LIPID
Replicates						
F3021	DO 67794	F	channel catfish	10.29	74.60	5.15
F3022	DO 67794	F	channel catfish	10.01	73.39	5.93

\* All data on a wet weight basis

FISH & WILDLIFE SERVICES - CATALOG No 5850 - PESTICIDE & PCB ANALYSIS

RAW FILE#	DIELDRIN (ppm)	ENDRIN (ppm)	CIS- NONACHLOR (ppm)	MIREX (ppm)	2,4' DDE (O,P' DDE) (ppm)	4,4' DDE (P,P' DDE) (ppm)	2,4' DDD (O,P DDD) (ppm)	4,4' DDD (P,P' DDD) (ppm)	2,4' DDT (O,P' DDT) (ppm)	4,4' DDT (P,P' DDT) (ppm)	TOTAL PCB'S (ppm)	TOXA- PHENE (ppm)
F3021P	0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	0.45	<0.10
F3022P	0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	0.52	<0.10



FISH & WILDLIFE SERVICES - CATALOG No 5850 - PESTICIDE & PCB ANALYSIS

RAW FILE#	DESCRIPTOR	ALPHA- BHC (ppm)	HCB (ppm)	BETA- BHC (ppm)	GAMMA- BHC (ppm)	DEL- BHC (ppm)	TOTAL BHC'S (ppm)	HEPTA- CHLOR (ppm)	ALDRIN (ppm)	HEPTA- EPOXIDE (ppm)	OXY- CHLORDANE (ppm)	GAMMA- CHLORDANE (ppm)	ALPHA- CHLORDANE (ppm)	TRANS- NONACHLOR (ppm)
F3021P	DO 67794	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
F3022P	DO 67794	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01

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FISH & WILDLIFE SERVICES - CATALOG # 5850  
QA/QC PESTICIDE AND PCB ANALYSES

FILE #	DESCRIPTION	SAMPLE WT (grams)	ALPHA BHC	HCB (CL2)	BETA BHC	LINDANE	DEL BHC	HEPTA- CHLOR	ALDRIN	HEPTA EPOXIDE	GAMMA- CHLORDANE	ALPHA- CHLORDANE	TRANS- NONACHLOR
SPIKED SAMPLES													
	AMOUNT SPIKED (ug)		2.1450	2.0450	2.2450	2.2700	2.1300	2.1050	2.3449	2.3100	2.0200	2.2050	2.2150
F3022	ORIG SAMPLE	10.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Q7569P	SPK SAMP F3022	10.03	0.0559	0.0083	0.0987	0.1323	0.2700	0.2239	0.2448	0.1928	0.1795	0.1957	0.2411
RECOVERED SPIKE (ug)			0.56	0.08	0.99	1.33	2.70	2.25	2.45	1.93	1.80	1.96	2.42
% RECOVERY			26	4	44	58	127	107	105	84	89	89	109

FISH & WILDLIFE SERVICES - CATALOG # 5850  
QA/QC PESTICIDE AND PCB ANALYSES

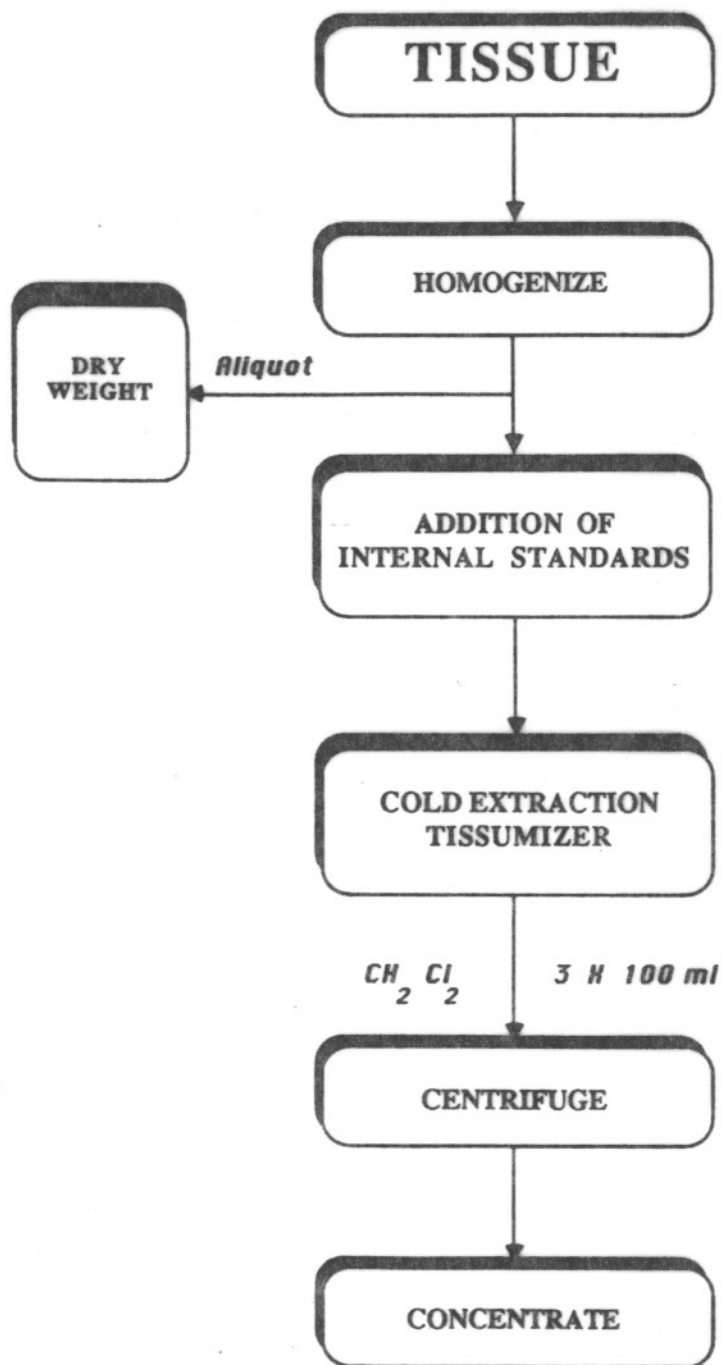
DIELDRIN	ENDRIN	MIREX	2,4' DDE (O,P' DDE)	4,4' DDE (P,P' DDE)	2,4' DDD (O,P' DDD)	4,4' DDD (P,P' DDD)	2,4' DDT (O,P' DDT)	4,4' DDT (P,P' DDT)	AVERAGE % PCB'S
2.1550	2.1050	2.1050	2.2450	2.1150	2.1350	2.1700	2.1750	2.3150	2.1128
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0077
0.2534	0.2041	0.2596	0.1730	0.2414	0.2394	0.2583	0.1971	0.2446	0.2210
2.54	2.05	2.60	1.74	2.42	2.40	2.59	1.98	2.45	2.1386
118	97	124	77	114	112	119	91	106	101

The tissue samples were extracted by the NOAA Status and Trends Method (MacLeod et al. 1985) with minor revisions (Brooks et al., 1988; Wade et al., 1988). A flow diagram of the procedure is attached. Briefly, the tissue samples were homogenized with a Teckmar Tissumizer. A 1-gram sample (wet weight) was extracted with the Teckmar Tissumizer by adding internal standards,  $\text{Na}_2\text{SO}_4$ , and methylene chloride in a centrifuge tube. The tissue extracts were purified by silica/alumina column chromatography to isolate the aliphatic and PAH/pesticide/PCB fractions. The fraction containing the PAH/pesticides/PCB fractionation was further purified by Sephadex chromatography in order to remove interfering lipids. The quantitative analyses were performed by capillary gas chromatography (CGC) with a flame ionization detector for aliphatic hydrocarbons, CGC with electron capture detector for pesticides and PCB's, and a mass spectrometer detector in the SIM mode for aromatic hydrocarbons (Wade et al., 1988).

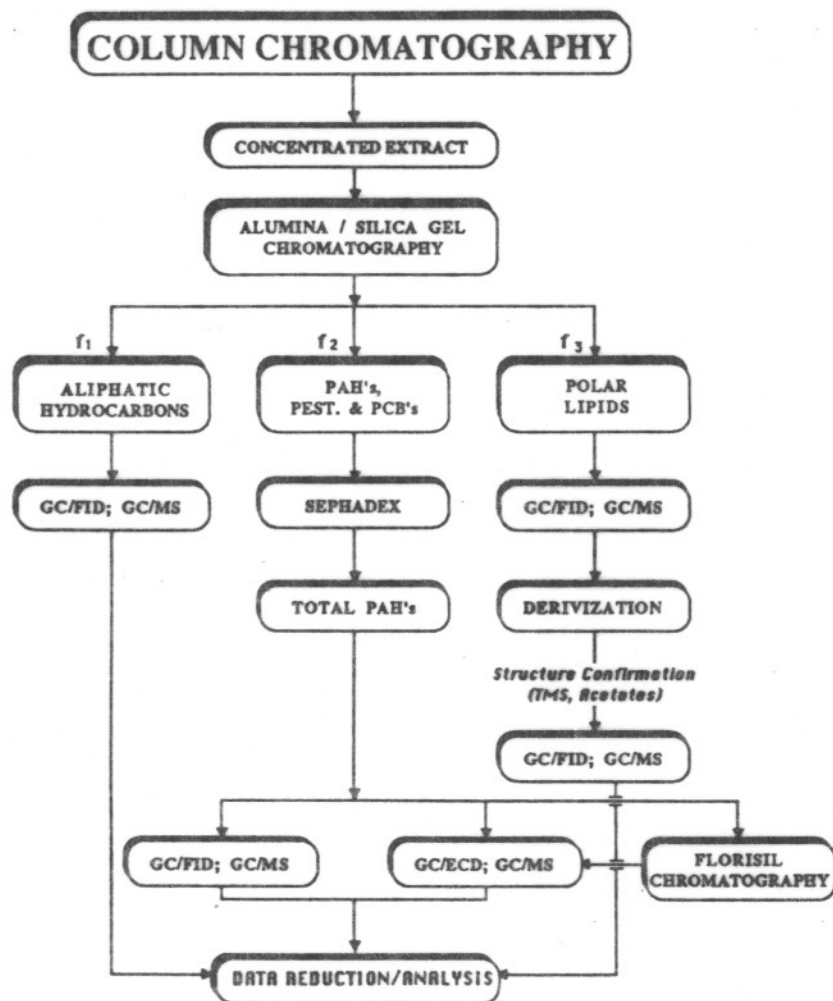
#### References

- Brooks, J.M., Wade, T.L., Atlas, E.L., Kennicutt II, M.C., Presley, B.J., Fay, R.R., Powell, E.N. and Wolff, G., (1987c). Analysis of bivalves and sediments for organic chemicals and trace elements. Annual Report for NOAA's National Status and Trends Program, Contract 50-DGNC-5-00262.
- MacLeod, W.D., Brown, D.W., Friedman, A.J., Burrow, D.G., Mayes, O., Pearce, R.W., Wigren, C.A. and Bogar, R.G. (1985). Standard Analytical Procedures of the NOAA National Analytical Facility 1985-1986. Extractable Toxic Organic Compounds, 2nd Ed. U.S. Department of Commerce, NOAA/NMFS. NOAA Tech. Memo. NMFS F/NWC-92.
- Wade, T.L., Atlas, E.L., Brooks, J.M., Kennicutt, M.C. II, Fox, R.G., Sericano, J., Garcia, B. and DeFreitas, D. (1988). NOAA Gulf of Mexico Status and Trends Program: Trace organic contaminant distribution in sediments and oysters. *Estuaries*, 11, 171-179.

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 TYPE: Brain, Liver,  
 NO. 6065  
 BATCH NO. 89-3-100C  
 ORDER NO. 85800-89-08272

MISSISSIPPI STATE, MS 39762  
 REPORT FORM  
 USD1/FWS

ORGANOCHLORINES

DATE RECEIVED 05/31/90

PARTS PER MILLION AS RECEIVED (WET WT)

FWS #	COEG-1	COEG-2	COEG-3	COEG-4	COEG-5	COEG-6	Blank
LAB #	784333	784334	784335	784336	784337	784338	784339
MATRIX	B. Eagle Brain	B. Eagle Liver	B. Eagle Brain	B. Eagle Liver	B. Eagle Liver	B. Eagle Carcass	Reagent
COMPOUND							
HCB	ND*	ND	ND	ND	ND	ND	ND
α-BHC	ND	ND	ND	ND	ND	ND	ND
γ-BHC	ND	ND	ND	ND	ND	ND	ND
β-BHC	ND	ND	ND	ND	ND	ND	ND
δ-BHC	ND	ND	ND	ND	ND	ND	ND
Oxychlordan	ND	ND	ND	ND	ND	ND	ND
Hept. Epox.	ND	ND	ND	ND	ND	ND	ND
γ-Chlordan	ND	ND	ND	ND	ND	0.01	ND
t-Nonachlor	ND	ND	ND	ND	ND	0.03	ND
Toxaphene	ND	ND	ND	ND	ND	ND	ND
Arochlor 1242	ND	ND	ND	ND	ND	ND	ND
Arochlor 1248	ND	ND	ND	ND	ND	ND	ND
Arochlor 1254	ND	0.32	ND	0.36	0.45	1.3#	ND
Arochlor 1260	ND	0.11	ND	0.22	0.27	0.79#	ND
o, p'-DDE	ND	ND	ND	ND	ND	ND	ND
α-Chlordan	ND	ND	ND	ND	ND	0.03	ND
p, p'-DDE	0.02	0.04	0.01	0.05	0.06	0.18#	ND
Dieldrin	ND	ND	ND	ND	ND	0.03	ND
o, p'-DDD	ND	ND	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND
cis-nonachlor	ND	ND	ND	ND	ND	ND	ND
o, p'-DDT	ND	ND	ND	ND	ND	ND	ND
p, p'-DDD	ND	ND	ND	ND	ND	ND	ND
p, p'-DDT	ND	ND	ND	ND	ND	ND	ND
Mirex	ND	ND	ND	ND	ND	ND	ND
WEIGHT (g)	8.90	49.5	10.1	65.2	45.0	670	-
MOISTURE (%)	83.5	74.0	84.2	73.5	73.5	72.0	-
LIPID (%)	3.00	3.20	6.10	3.70	4.80	5.42	-

Lower Level of Detection = 0.01 ppm for Tissue, Soil, Etc. 0.05 for Toxaphene and PCBs.  
 For Water, LLD= 0.005 ppm for OCs, Tox, PCBs.; \*ND = None Detected;  
 \*\*Spike = ppm for ; # = Confirmed by GC/Mass Spectrometry \*\*\*NS = Not Spiked  
 # = Confirmed By GC/MS as Total Arochlors; Ions Common to Both Arochlors Preclude Distinguishing Between Congeners.

*Larry L. Lane*  
 Signature

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BOX CR  
MISSISSIPPI STATE, MS 39762  
REPORT FORM  
USD1/FWS

Page 2

20  
Brain, Liver,  
NO. 6065  
BATCH NO. 89-3-100C  
ORDER NO. 85800-89-  
08272

ORGANOCHLORINES

DATE RECEIVED 05/31/90

PARTS PER MILLION AS RECEIVED (WET WT)

FWS #	Matrix Blank	Spike**	% Recovery				
LAB #	for	784340					
MATRIX	Liver	Liver					
COMPOUND							
HCB	ND*	0.070	70				
$\alpha$ -BHC	ND	NS***					
$\gamma$ -BHC	ND	0.090	90				
$\beta$ -BHC	ND	0.10	100				
$\delta$ -BHC	ND	NS					
Oxychlordane	ND	0.091	91				
Hept. Epox.	ND	0.10	100				
$\gamma$ -Chlordane	ND	NS	ND				
t-Nonachlor	ND	0.10	100				
Toxaphene	ND	NS					
Arochlor 1242	ND	NS					
Arochlor 1248	ND	NS					
Arochlor 1254	ND	1.0	100				
Arochlor 1260	ND	1.1	110				
o, p'-DDE	ND	0.10	100				
$\alpha$ -Chlordane	ND	0.097	97				
p, p'-DDE	ND	0.095	95				
Dieldrin	ND	0.091	91				
o, p'-DDD	ND	NS					
Endrin	ND	0.10	100				
cis-nonachlor	ND	0.097	97				
o, p'-DDT	ND	0.095	95				
p, p'-DDD	ND	0.098	98				
p, p'-DDT	ND	0.095	95				
Mirex	ND	0.095	95				
WEIGHT (g)	-	-					
MOISTURE (%)	75.2	73.0					
LIPID (%)	5.32	6.40					

Lower Level of Detection = 0.01 ppm for Tissue, Soil, Etc. 0.05 for Toxaphene and PCBs.  
For Water, LLD= 0.005 ppm for OCs, Tox, PCBs

\*\*Spike = 0.10 ppm for Liver except Arochlor @ 1.0 ppm.

\* = Confirmed by GC/Mass Spectrometry

\*ND = None Detected

\*\*\*NS = Not Spiked

Signature

*Larry A. Lene*

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Animal Tissue - ICP  
Results in µg/g (dry weight)

Element	Sample Number			
	COEG-6			
Al	<8.00			
Sb	<15.0			
Ba	2.61			
Be	<0.200			
B	<2.50			
Cd	<0.500			
Co	<3.00			
Cr	<3.00			
Cu	3.38			
Fe	168			
Pb	<5.00			
Mg	1370			
Mn	3.76			
Mo	<5.00			
Ni	<4.00			
Ag	<10.0			
Sr	30.3			
Sn	<15.0			
V	<2.00			
Zn	116			

Sample Analyses  
Animal Tissue - AA

Results in  $\mu\text{g/g}$  (dry weight)

Element	Sample Number					
	COEG-1	COEG-2	COEG-3	COEG-4	COEG-5	COEG-6
As	-----	<0.3	-----	<0.3	<0.3	<0.3
Hg(CV)	0.343	0.658	0.213	0.496	0.601	0.212
Se	-----	4.34	-----	3.82	4.69	1.40
% Mois.	81.0	70.2	80.6	71.1	70.4	70.7





IN REPLY REFER TO:

FWS/AES-EC

*This is raw data. Report  
was SZ. Find & Attach*

United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Bishop Henry Whipple Federal Building  
1 Federal Drive  
Fort Snelling, MN 55111-4056

August 31, 1994

*FY1988 Study ID# 88-3-110  
8830012.1*



*on-Ref*

Memorandum

To: Superfund Project Coordinator, Marion (MISO)  
From: Chief, Division of Environmental Contaminants  
Subject: Report of Analytical Results from Fish: Study ID 88-3-110

Attached please find the subject results. These results are for fish that were collected from Crab Orchard Lake and are cross-checks with the laboratory used by O'Brien and Gere.

The results from the fish tissue analyses confirm that the composite results exceed the FDA action level. The results for mercury indicate elevated concentrations but do not exceed the FDA action level in this composite. The analyses confirm that lead concentrations are quite elevated, but there are presently no guidances for regulation of lead in fish tissue.

I hope you find this report useful. Please call if you have any questions.

*T.J. Miller*  
T.J. Miller

Attachment

*Marion IL FO  
FWS# 89-3-100  
Contaminant Studies Crab Orchard  
DECID# 1989 30007*

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/07

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Mercury

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	NOT DETERMINED		5145
34-30	fish	NOT DETERMINED		5146
34-27	fish	0.58	2.6	5147
17-71	fish	NOT DETERMINED		5148

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09  
CAI #: 5469 REGIONAL ID 003-88-R3  
DESCRIPTION : Crab Orchard  
Analyte: Mercury / Quality Assurance

Procedural Blanks

SAMPLE #	Total Uq	ACCEPTABLE
5164	0.030	<u>2</u>

\*\* Invalid spike

Recoveries

Recoveries from fortified chicken livers averaged 99 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .05 ppm wet weight, based on a 1.0 g sample.

These analyses were performed at the Patuxent Analytical Control Facility in accordance with our Quality Assurance Program. We are confident that the data reported here are accurate.

  
ANALYST

  
CHIEF CHEMIST

Rec'd 2/23/88

QUALITY ASSURANCE REVIEW FORM

CATALOG: 5-467

DATE: 2/19/88

ANALYTES: Lead

I certify that these analyses were performed according to the  
Environmental Contaminants Branch Quality Assurance Program.

There were no deviations from the plan ✓.

Deviations from the plan were necessary       . Attach explanation.

*Paul Hartman*  
Laboratory Supervisor

These data have been reviewed and are cleared for release to submitter.

2-19-88  
Date

*John M. ...*  
Quality Assurance Officer



U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20703

REPORT

Date: 88/02/19

CAT #: 3469

REGIONAL ID 003-83-R3

DESCRIPTION : Crab Orchard

Analyte: Lead

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-27	fish	NOT DETERMINED		5165
34-30	fish	NOT DETERMINED		5166
34-27	fish	NOT DETERMINED		5167
17-71	fish	16	69	5168



U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel Maryland 20708

REPORT

Date: 88/02/16  
CAT #: 8489 REGIONAL ID 008-88-R3  
DESCRIPTION : Crab Orchard

Analyst: Lead / Quality Assurance

Procedural Blanks

SAMPLE #	Total Ue	ACCEPTABLE
5184	0.067	<u>          </u>

\*\* - Invalid spike

Recoveries

Recoveries from fortified chicken livers averaged 90 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .05 ppm wet weight, based on a 1.0 g. sample.

These analyses were performed at the Patuxent Analytical Control Facility in accordance with our Quality Assurance Program. We are confident that the data reported here are accurate.

David Hartung  
ANALYST

David Hartung  
CHIEF CHEMIST

Rec'd 2/23/88

QUALITY ASSURANCE REVIEW FORM

CATALOG: 5469

DATE: 2/19/88

ANALYTES: Oil Particles and PCB's

I certify that these analyses were performed according to the  
Environmental Contaminants Branch Quality Assurance Program.

There were no deviations from the plan ✓.

Deviations from the plan were necessary       . Attach explanation.

David Hartung  
Laboratory Supervisor

These data have been reviewed and are cleared for release to submitter.

2-19-88  
Date

John Moore  
Quality Assurance Officer

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Moisture

Submitter ID	Matrix	Result	Units	Lab #
34-29	fish	75.82	PER CENT	5165
34-30	fish	73.76	PER CENT	5166
34-27	fish	77.93	PER CENT	5167
17-71	fish	76.77	PER CENT	5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 98/02/08

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Lipid

Submitter ID	Matrix	Result	Units	Lab #
34-29	fish	2.19	PER CENT	5165
34-30	fish	5.83	PER CENT	5166
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Estimated PCB-1254 /OC SCAN

CAS# 11097-69-1

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	3.9	16.	5165
34-30	fish	4.4	17.	5166 X
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

GAT #: 5467

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Estimated PCB-1254 / OC SCAN / Quality Assurance

CAS # 11097-69-1

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.100

ACCEPTABLE

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 91 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .1 ppm wet weight, based on a 10.0 g. sample.



U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Oxychiordane /OC SCAN

CAS# 27304-13-8

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	< 0.0099	< 0.038	5166
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Orychlodane / OC SCAN / Quality Assurance

CAS # 27304-13-8

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 84 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.



U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Heptachlor Epoxide /OC SCAN

CAS# 1024-57-3

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	< 0.0099	< 0.038	5166
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Heptachlor Epoxide / OC SCAN / Quality Assurance

CAS # 1024-57-3

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 85 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: trans-Nonachlor /OC SCAN

CAS# 39765-80-5

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	0.068	0.26	5166 *
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: trans-Nonachlor / OC SCAN / Quality Assurance

CAS # 39765-80-5

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* n. Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 89%. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: trans-Chlordane /OC SCAN

CAS# 5103-74-2

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	0.049	0.19	5166*
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

GAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: trans-Chlordane / OC SCAN / Quality Assurance

CAS # 5103-74-2

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* = Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 90%. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.



U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: cis-Chlordane /OC SCAN

CAS# 5103-71-9

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	0.072	0.27	5166 *
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: cis-Chlordane / OC SCAN / Quality Assurance

CAS # 5103-71-9

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE  
✓

\*\* = Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 88 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.



U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/07

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Dieldrin /OC SCAN

CAS# 60-57-1

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	0.029	0.11	5166 *
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Dieldrin / OC SCAN / Quality Assurance

CAS # 60-57-1

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE  
✓

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 95 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: p,p'-DDE /OC SCAN

CAS# 72-55-9

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	0.72	3.0	5165
34-30	fish	0.75	2.9	5166 *
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: p,p'-DDE / OC SCAN / Quality Assurance

CAS # 72-55-9

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE  
✓

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 96 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Endrin /OC SCAN

CAS# 72-20-8

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	< 0.0099	< 0.038	5166
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: Endrin / OC SCAN / Quality Assurance

CAS # 72-20-8

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* = Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 113 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: cis-Nonachlor /OC SCAN CAS#

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	0.021	0.081	5166 ✓
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168



U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 3469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: cis-Nonachlor / OC SCAN / Quality Assurance

CAS #

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* = Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 95 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.



U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: p,p'-DDD /OC SCAN

CAS# 72-54-8

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5165
34-30	fish	< 0.0099	< 0.038	5166
34-27	fish	NOT DETERMINED		5167
17-71	fish	NOT DETERMINED		5168

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: p,p'-DDD / OC SCAN / Quality Assurance

CAS # 72-54-8

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE

\*\* : Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 106 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 5469

REGIONAL ID 003-88-R3

DESCRIPTION: Crab Orchard

Analyte: p,p'-DDT /OC SCAN

CAS# 50-29-3

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.0099	< 0.041	5155
34-30	fish	< 0.0099	< 0.038	5156
34-47	fish	NOT DETERMINED		5157
17-71	fish	NOT DETERMINED		5158

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/01/09

CAT #: 3469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte: p,p'-DDT / OC SCAN / Quality Assurance

CAS # 50-29-3

Procedural Blanks

SAMPLE #  
5164

Total Ug  
<0.010

ACCEPTABLE  
✓

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged 114 %. Residues were not adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .01 ppm wet weight, based on a 10.0 g. sample.

U. S. Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 88/02/09

CAT #: 3469

REGIONAL ID 003-88-R3

DESCRIPTION : Crab Orchard

Analyte Estimated Toxaphene /OC SCAN

CAS# 8001-35-2

Submitter ID	Matrix	UG/G (WET)	UG/G (DRY)	Lab #
34-29	fish	< 0.50	< 2.1	5155
34-30	fish	< 0.49	< 1.9	5156
34-27	fish	NOT DETERMINED		5157
17-71	fish	NOT DETERMINED		5158

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

Date: 98/02/09

CAT #: 5469

REGIONAL ID 003-98-R3

DESCRIPTION: Crab Orchard

Analyte: Estimated Toxaphene / GC SCAN / Quality Assurance

CAS # 8001-35-2

Procedural Blanks

SAMPLE #  
5164

Total Ug  
60 500

ACCEPTABLE

\*\* - Recovery Invalid

Recoveries

Recoveries from fortified tissues averaged Residues were not  
adjusted on the basis of this datum.

Detection Limit

The nominal lower limit of reportable residue is .5 ppm wet weight, based on  
a 10.0 g. sample.

U S Fish and Wildlife Service  
Patuxent Wildlife Research Center  
Patuxent Analytical Control Facility  
Laurel, Maryland 20708

REPORT

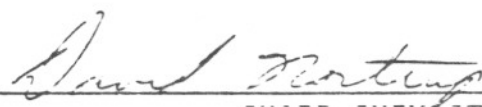
Date: 88/02/09  
LOT #: 5469 REGIONAL ID 003-88-R3  
DESCRIPTION : Crab Orchard

Analyst: CC Scan /Quality Assurance

These analyses were performed at the Patuxent Analytical Control Facility in accordance with our Quality Assurance Program. We are confident that the data reported here are accurate.

Compound identification of A values were confirmed by mass spectrometry.

\_\_\_\_\_  
ANALYST

  
\_\_\_\_\_  
CHIEF CHEMIST