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Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509) 376-5345
FAX (509) 376-9201

January 6, 1993

Mr. Larry C. Hulstrom
Environmental Engineering Group
Environmental Division
Westinghouse Hanford Company
P.O. Box 1970/~~H4-55~~ H6-03
Richland, WA 99352

MAY 1993 RECEIVED

OCT 1996 RECEIVED EDMC

Dear Mr. Hulstrom:

ORGANICS RESULTS FROM BATTELLE DUXBURY

Enclosed is the data package from Battelle Ocean Sciences laboratory on organics residues in mouse tissue.

If you have any questions, please call me at the number above.

Very truly yours,

Charles A. Brandt, Ph.D.
Project Manager
Environmental Sciences Department

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January 4, 1993

Battelle
. . . Putting Technology To Work
Ocean Sciences
397 Washington Street
Duxbury, Massachusetts 02332
Telephone (617) 934-0571

Mr. Charles Brandt
Room K6-0-9
Battelle Pacific Northwest Laboratories
Battelle Boulevard
Richland, WA 99352

Dear Mr. Brandt:

Attached you will find the data tables that summarize the results of Battelle Ocean Sciences' (BOS) analyses of the rodent tissue samples you submitted for determination of concentrations of a set of chlorinated pesticides and polychlorinated biphenyl (PCB). The first table presents the results for the two field samples and the procedural blank quality control sample. Sample moisture and lipid content are also reported with the field sample data. The second table presents the results for the two matrix spike quality control samples.

The analyte concentrations are reported on a wet weight basis. Low levels (ranging from 0.1 to 5 ng/g, wet weight) of hexachlorobenzene, heptachlorepoxide, transnonachlor, dieldrin, 4,4-DDD, and mirex were detected in both samples. The concentration of 4,4-DDE was significantly higher; approximately 31 and 15 ng/g, wet weight, for B07G69 and B07GD2, respectively. The identifications of these seven pesticides were qualitatively confirmed using second-column GC/ECD analysis. The 4,4-DDE concentration is equivalent to approximately 108 and 48 ng/g *dry* weight for B07G69 and B07GD2, respectively. The relative concentration of 4,4-DDT, 4,4-DDD, and 4,4-DDE suggests that the animals have been exposed to "old" DDT contamination, because the vast majority was found to be the DDT degradation product 4,4-DDE. Alternatively, the animals themselves may have degraded/metabolized accumulated DDT and/or DDD.

The moisture content for the two tissue samples was determined to be 71.1% and 69.5% and the lipid content was 0.210 g/g (21.0%) and 0.277 g/g (27.7%), dry weight, for B07G69 and B07GD2, respectively. Both samples had a clearly identifiable PCB pattern which most closely resembled Aroclor 1260. The total PCB concentration, as Aroclor 1260, was determined to be approximately 184 and 81 ng/g, wet weight, for B07G69 and B07GD2, respectively, which is equivalent to approximately 640 and 270 ng/g on a *dry* weight basis. Concentrations of the 20 individual PCB congeners that were analyzed for are also reported.

The quality control sample results were consistently very good, and lend support to the overall accuracy and precision of the field sample analyses. The procedural blank showed no evidence of laboratory contamination. The trace amounts of the PCB congener Cl_7(170) detected is equivalent to approximately 0.02 ng/g in a sample (the procedural blank data are reported as total nanogram amounts), which is significantly below the limit of reliable detection. The surrogate recoveries were invariable good, ranging from 72% to 87%, and are well within the acceptable range of 40% to 120%. The matrix spike data are reported as relative recoveries (relative to the surrogate compounds used for analyte quantification) and

absolute recoveries. The absolute recoveries show the overall efficiency of the sample preparation (like the surrogate recovery data) for all target analytes, and the relative recoveries are a measure of the accuracy of the target analyte quantification. The matrix spike data were very good, and, with the exception for elevated recoveries of three PCB congeners, all recoveries meet the data quality objectives, indicating a high level of accuracy. The reason for the isolated elevated matrix spike recoveries is that the sample used for the matrix spike analyses (B07G69) contained approximately two times more of these particular analytes than the amount they were fortified with for the matrix spike analysis, which is inappropriate for a representative matrix spike recovery determination (the spiking level should be at least five to ten times greater than the "background" levels), and these elevated recoveries are therefore not representative of the field sample analyses. The analytical precision was also good, with the relative percent difference (%RPD) in the matrix spike/matrix spike duplicate recovery determinations consistently meeting the data quality objective of less than 30%.

The raw data from these analyses will be archived following standard BOS procedures. All the tissue material that was provide to us was used for the analyses. The sample extracts will be disposed of in 90 days, unless BOS is requested to provide them to PNL. If you would like to discuss these data or have any questions at all please feel free to contact me at (617) 934-0571.

Sincerely,

Gregory S. Durell

Gregory S. Durell
Research Scientist

PROJECT #: G1969-0010
FILE: RATDATA

ENTERED BY: B. Koczwara
Procedural Blank reported in ng.
Sample Data - Reported in ng/g, wet weight.

PNL ID:	NA		B07G69		B07GD2
BOS ID:	LY68PB		LP12		LP13
Sample Wet Weight (g):	1.000		11.871		18.802
Moisture Content (%):	NA		71.1		69.5
Lipid Content (g/g, dry weight):	NA		0.210		0.277
HCB	ND		1.05		0.42
LINDANE	ND		ND		ND
HEPTACHLOR	ND		ND		ND
ALDRIN	ND		ND		ND
HEPTACHLOREPOXIDE	ND		0.52		0.36
2,4-DDE	ND		ND		ND
CIS-CHLORDANE	ND		ND		ND
TRANSNONACHLOR	ND		1.70		4.73
DIELDRIN	ND		1.66		0.51
4,4-DDE	ND		31.21		14.66
2,4-DDD	ND		ND		ND
ENDRIN	ND		ND		ND
4,4-DDD	ND		0.60		0.28
2,4-DDT	ND		1.27	NC	0.52 NC
4,4-DDT	ND		0.58		ND
MIREX	ND		0.18		0.09
CL2(08)	ND		ND		ND
CL3(18)	ND		ND		ND
CL3(28)	ND		ND		ND
CL4(52)	ND		0.24		ND
CL4(44)	ND		0.15		0.17
CL4(66)	ND		ND		ND
CL5(101)	ND		0.48		ND
CL4(77)	ND		ND		ND
CL5(118)	ND		4.95		1.81
CL6(153)	ND		25.03		12.62
CL5(105)	ND		4.35		0.86
CL6(138)	ND		22.23		9.70
CL5(126)	ND		ND		ND
CL7(187)	ND		10.65		2.96
CL6(128)	ND		1.53		0.58
CL7(180)	ND		20.02		9.82
CL7(170)	3.60		5.29		5.00
CL8(195)	ND		1.10		0.58
CL9(206)	ND		1.18		0.69
CL10(209)	ND		0.12		0.08
AROCLOR 1260	ND		183.7		81.1
Surrogate Recoveries					
DBOFB	87		82		77
CL5(112)	80		78		72

NC = pesticide analyte not confirmed

PROJECT #: G1969-0010
FILE: RATDATA

ENTERED BY: B. Koetwara
Matrix Spike Recovery Data - Reported in %

BOS ID:	Relative Recovery (%)			Absolute Recovery (%)		
Sample Wet Weight (g):	LY69MS 2.571	LY70MSD 3.005	% RPD	LY69MS 2.571	LY70MSD 3.005	% RPD
CL2(08)	102	114	11	79	94	18
HEXACHLOROBENZENE	90	95	5	70	79	12
LINDANE	82	93	13	64	77	19
CL3(18)	88	96	9	68	79	15
CL3(28)	90	101	11	70	83	17
HEPTACHLOR	89	93	5	69	77	11
CL4(52)	95	102	7	74	84	13
ALDRIN	78	83	6	61	69	12
CL4(44)	93	100	7	72	83	13
HEPTACHLOREPOXIDE	88	91	3	68	75	9
CL4(66)	104	115	10	81	95	16
2,4-DDE	84	90	7	65	74	13
CL5(101)	101	106	5	78	88	11
CIS-CHLORDANE	84	87	4	65	72	11
TRANS-NONACHLOR	93	94	1	72	78	7
DIELDRIN	95	97	2	73	80	10
4,4-DDE	111	82	29	85	68	22
CL4(77)	110	118	7	84	97	14
2,4-DDD	99	102	3	76	84	11
ENDRIN	102	107	5	78	88	12
CL5(118)	97	98	1	75	81	8
4,4-DDD	92	100	9	70	83	16
2,4-DDT	92	93	1	70	77	9
CL6(153)	192 *	163 *	17	147 **	134 **	9
CL5(105)	100	85	17	77	70	9
4,4-DDT	99	101	1	76	83	9
CL6(138)	132 *	103	25	101	85	17
CL5(126)	108	112	4	83	93	11
CL7(187)	127	114	11	97	94	3
CL6(128)	97	100	3	74	83	11
CL7(180)	158 *	128	21	121 **	106	13
MIREX	95	97	2	72	80	10
CL7(170)	109	111	1	84	91	9
CL8(195)	101	96	5	77	79	3
CL9(206)	79	89	11	61	73	18
CL10(209)	101	99	2	77	82	6

Surrogate Recoveries

DBOFB	78	82
CL5(112)	76	83

* = Analyte outside of the MS/MSD data quality objective range for relative recovery (70% - 130%).
** = Analyte outside of the MS/MSD data quality objective range for absolute recovery (40% - 120%).
%RPD = ([MS % recovery - MSD % recovery]*2*100%)/(MS % recovery + MSD % recovery)