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TITLE: ANALYSIS OF KRUMMRICH SOIL SAMPLES

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ABSTRACT: Soil samples from the Krummrich plant were analyzed for their PCB, TCDD and Mercury content. Results of these analyses are shown in this report.

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I. INTRODUCTION

A total of forty-one (41) samples, were received from the Krummrich plant for analyses. The analyses to be conducted were for possible concentrations of polychlorinated biphenyls (PCB); 2,3,7,8-tetrachlorodibenzodioxin (TCDD) and mercury. All analyses were conducted in accordance to U.S. EPA approved or accepted procedures. For internal purposes the samples were assigned MRC Log # 1-83-07-18-02.

II. SUMMARY

Tables 1-3 shows the results for the analyses of the samples for their PCB concentrations. Table 4 shows total organic carbon, (TOC) and phenol analyses conducted on specified samples while table 5 shows the TCDD results requested on specific samples. Table 6 shows the concentrations of mercury found in the specified samples.

III. ANALYSIS RESULTS

3.1 PCB ANALYSES

3.1.1 SAMPLE EXTRACTION

Solid samples were first visually inspected to determine general qualities, eg. wet, oily, containing plant material etc. Four general types of samples were received for analysis. They were: rocky concrete material, soil, sludge, and liquid. In general each sample posed different analytical separation problems of which sample homogeneity was considered to be most critical. Rocky concrete material required larger sample weights in order to obtain a representative sample; soils and lagoon sludge required smaller

analysis. They were: rocky concrete material, soil, sludge, and liquid. In general each sample posed different analytical separation problems of which sample homogeneity was considered to be most critical. Rocky concrete material required larger sample weights in order to obtain a representative sample; soils and lagoon sludge required smaller weights for analysis. The liquid sample (primarily water) required larger amounts due to lower levels of detection required.

The separation scheme for solids was as follows. An aliquot of the solid sample was weighed into a 40 mL Pierce vial with teflon faced caps in the following quantities: rocky concrete materials, 10-20 g; soils approximately, 1.0 g; and lagoon sludge 0.1 g. The samples were spiked with 100 µL of 10 µg/mL pentachlorobenzene as a surrogate spiking compound. 10.0 mL benzene was pipetted into the Pierce vial, and the samples were then placed into an ultrasound bath for 30 minutes.

The separation technique for liquids was as follows. 100 mL of sample was added to a 125 mL separatory funnel. The sample was spiked with 100 µL of 10 µg/mL pentachlorobenzene and allowed to equilibrate for 30 minutes. The sample was extracted three times with three 10 mL aliquots of methylene chloride. The extracts were combined in a graduated centrifuge tube and the volume was reduced to 1.0 mL under a nitrogen stream.

The extracts were then inspected for suitability for capillary GC/EC instrumental analysis, and dilutions were made accordingly before analysis.

Relative response factors were calculated for the major PCB isomers in the three formulations and the capillary GC/EC data were analyzed using a different set of response factors for each formulation. The presence of one or more of the three Aroclor formulations was confirmed by visual inspection of the GC/EC chromatograms and by using the table of concentrations printed out using the three sets of relative response factors of the characteristic PCB isomers of the three Aroclor formulations.

3.1.3. RESULTS

Tables 1-3 summarize the concentrations of Aroclor 1248, 1254 and 1260 measured using the above extraction and analysis protocol. Recoveries of pentachlorobenzene surrogate spiking compound are also reported in the tables.

3.2 TOC AND PHENOL ANALYSES

3.2.1 The total organic carbon (TOC) and total phenol concentrations were determined to U.S. EPA standard analysis (1)

3.3 TCDD ANALYSIS

The samples were analyzed according to the EPA Region VII June 1983 method "Determination of 2,3,7,8-TCDD in Soil and Sediment." For quality control purposes MRC Method Number 07-QAQC-R3 was followed. Briefly this method requires that for every set of samples of the same matrix type a replicate sample, a low (0.8 ppb in this case) spiked sample, a high (8.1 ppb in this case) spiked sample, and a method blank must be analyzed.

3.3.1 Preparation and Analysis

Samples of 10 g were weighed out and spike with 25.9 ng of carbon-13 labeled 2,3,7,8-TCDD and 10.8 ng of chlorine-37 labeled 2,3,7,8-TCDD. Ten grams of washed anhydrous sodium

TABLE 1. RESULTS OF CAPILLARY GC/EC ANALYSES OF KRUMMRICH PLANT SAMPLES

483.24618 and 483.24918 — August 15, 1983

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: 1 Soil	1a Solid	2 Solid	3 Liquid	4 Soil	4a Soil
			Concentration (µg/g)					
Aroclor 1248	GC/EC	0.1	.68	10.6	ND[b]	.146	233	161
Aroclor 1254	GC/EC	0.1	.21	5.9	ND	.06	100	62
Aroclor 1260	GC/EC	0.1	.15	3.5	ND	.076	15.2	18
TOTAL AROCLOR	GC/EC	0.1	1.04	20.0	ND	0.232	348.2	241.0
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentachlorobenzene	GC/EC	0.1	82	42	102	112	NA[c]	NA
Process File			BP 108	BP 116	BP 111	BP 130	BP 134	132
Extract Dilution			1:1	1:10	1:1	1:10	1:100	1:100
MRC Extraction Number	-		PCB 003	PCB 002	PCB 012	PCB 015	PCB 010	PCB 004
Sample Wt.-Extracted (g)	-		4.26	7.64	4.34	100	8.7	6.16

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analyzed due to sample extract dilution.

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TABLE 1. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification					
			5 Soil	5a Solid	6 Soil	6a Solid	7 Soil	7a Solid
			Concentration (µg/g)					
Aroclor 1248	GC/EC	0.1	24.9	370	2.78	12.4	3.6	100
Aroclor 1254	GC/EC	0.1	11.8	360	1.02	5.4	2.9	43
Aroclor 1260	GC/EC	0.1	2.6	340	0.49	3.1	7.8	89.9
TOTAL AROCLOR	GC/EC	0.1	39.3	1070	4.29	20.9	14.3	232.9
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentaclorobenzene	GC/EC	0.1	73	NA	40	86	236[d]	NA
Process File			BP 135	BP 118	BP 110	BP 115	BP 119	BP 133
Extract Dilution			1:10	1:1000	1:1	1:10	1:10	1:100
NRC Extraction Number	-		PCB 011	PCB 005	PCB 009	PCB 001	PCB 006	PCB 007
Sample Wt. Extracted (g)	-		7.03	9.99	7.36	7.7	14.23	10.01

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analyzed due to sample extract dilution.

[d] = High recovery possibly due to the presence of pentachlorobenzene in soil sample.

TABLE 1. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: 7a Solid (Duplicate)	Method Blank	Method Blank	KS 854		
			Concentration (µg/g)					
Aroclor 1248	GC/EC	0.1	164	ND[b]	ND	ND (<1.0)		
Aroclor 1254	GC/EC	0.1	61.3	ND	ND	2.1		
Aroclor 1260	GC/EC	0.1	12	ND	ND	16.5		
TOTAL AROCLOR	GC/EC	0.1	237.3	ND	ND	18.6		
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentaclorobenzene	GC/EC	0.1	NA[c]	86	94	92		
Process File			BP 136	BP 109	BP 172	BP120		
Extract Dilution			1:100	1:1	1:1	1:1		
MRC Extraction Number	-		PCB 013	PCB 008	PCB 014	PCB 058		
Sample Wt. Extracted (g)	-		10	0	0	1.0		

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analysed due to sample extract dilution.

TABLE 2. RESULTS OF CAPILLARY GC/EC ANALYSES OF KRUMMRICH PLANT SAMPLES

483.24718 August 15, 1983

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: Method Blank	KRS 1	KRS 2	KRS 3	KLS	KLS (D)
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	ND[b]	ND	ND	ND	824	906
Aroclor 1254	GC/EC	1	ND	ND	ND	ND	328	306
Aroclor 1260	GC/EC	1	ND	ND	ND	ND	194	188
TOTAL AROCLOR	GC/EC	1	ND	ND	ND	ND	1,346	1,400
Surrogate Spiking Compound	Anelysis Method	Amount added (µg/g)	Recovery (%)					
Pentaclorobenzene	GC/EC	1	107	90	87	95	208[c]	192[c]
Process Pile			BP 160	BP 162	BP 163	BP 164	BP 179	BP 180
Extract Dilution			1:1	1:1	1:1	1:1	1:10	1:10
HRC Extraction Number	-		PCB 052	PCB 053	PCB 054	PCB 055	PCB 047	PCB 048
Sample Wt. Extracted (g)	-		0	1.117	1.135	1.168	0.119	0.116

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] High recovery possibly due to the presence of pentaclorobenzene in soil sample.

TABLE 3. RESULTS OF CAPILLARY GC/EC ANALYSES OF KRUMBRICH PLANT SAMPLES

481.24518 August 15, 1983

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: KR 01	KR 01 (D)	KR 02	KR 03	KR 03 (D)	KR 04
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	5.4	4.14	84	ND	ND	ND
Aroclor 1254	GC/EC	1	5.0	4.68	90	12.5	10	1.45
Aroclor 1260	GC/EC	1	5.6	6.28	200	2.9	2.9	7.45
TOTAL AROCLOR	GC/EC	1	16	15.1	374	15.4	12.9	8.90
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentachlorobenzene	GC/EC	1	103	122	131	103	107	104
Process File			BP 124	BP 136	BP 106	BP 111	BP 110	BP 123
Extract Dilution			1:1	1:1	1:10	1:1	1:1	1:1
HRC Extraction Number	-		PCB 042	PCB 041	PCB 017	PCB 023	PCB 022	PCB 040
Sample Wt. Extracted (g)	-		1.028	1.019	1.026	1.042	1.037	1.052

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analyzed.

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TABLE 3. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: KR 04 (D)	KR 05	KR 06	KR 07	KR 08	KR 09
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	2.69	1.1	2.8	1.55	ND[b]	ND
Aroclor 1254	GC/EC	1	1.25	2.5	2.45	1.42	8.2	6.1
Aroclor 1260	GC/EC	1	7.22	.3	3.68	2.4	14.5	14.2
TOTAL AROCLOR	GC/EC	1	11.16	3.9	8.93	5.37	22.7	20.3
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentachlorobenzene	GC/EC	1	107	1408[c]	108	113	107	111
Process File			BP 137	BP 138	BP 139	BP 140	BP 121	BP 105
Extract Dilution			1:1	1:1	1:1	1:1	1:1	1:1
HRC Extraction Number	-		PCB 039	PCB 035	PCB 019	PCB 038	PCB 036	PCB 016
Sample Wt. Extracted (g)	-		1.047	1.039	1.028	1.015	1.001	1.003

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] = High recovery possibly due to the presence of pentachlorobenzene in soil samples.

TABLE 1. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification					
			KR 10	KR 11	KR 12	KR 13	KR 14	KR 15
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	ND	ND	ND	3.1	ND	ND
Aroclor 1254	GC/EC	1	ND	1.7	ND	7.6	11.1	.83
Aroclor 1260	GC/EC	1	ND	.96	ND	.96	10.9	1.13
TOTAL AROCLOR	GC/EC	1	ND	2.66	ND	11.66	22.0	1.96
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentaclorobenzene	GC/EC	1	112	163	106	109	117	119
Process File			BP 115	BP 119	BP 120	BP 141	BP 117	BP 113
Extract Dilution			1:1	1:1	1:1	1:1	1:1	1:1
HRC Extraction Number	-		PCB 028	PCB 032	PCB 033	PCB 018	PCB 029	PCB 026
Sample Wt. Extracted (g)	-		1.038	1.018	1.037	1.009	1.000	1.023

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analysed.

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TABLE 3. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification					
			KR 16	KR 17	KR 17 (D)	KR 18	KR 19	KR 20
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	.77	ND	ND	ND	23	.89
Aroclor 1254	GC/EC	1	1.7	ND	ND	ND	26.7	.89
Aroclor 1260	GC/EC	1	1.2	ND	ND	ND	16.3	1.44
TOTAL AROCLOR	GC/EC	1	3.67	ND	ND	ND	66	3.22
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentaclorobenzene	GC/EC	1	112	114	115	107	130	118
Process File			BP 142	BP 131	BP 145	BP 146	BP 122	BP 147
Extract Dilution			1:1	1:1	1:1	1:1	1:1	1:1
NRC Extraction Number	-		PCB 021	PCB 031	PCB 030	PCB 024	PCB 037	PCB 034
Sample Wt. Extracted (g)	-		1.048	1.015	1.036	1.011	1.012	1.001

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analyzed.

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TABLE 3. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: KR 21	KR 22	KR 23	KR 24	Method Blank	Method Blank
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	ND	ND	2.3	-	ND	ND
Aroclor 1254	GC/EC	1	1.2	ND	1.6	-	ND	ND
Aroclor 1260	GC/EC	1	1.73	ND	1.9	-	ND	ND
TOTAL AROCLOR	GC/EC	1	2.93	ND	5.8	-	ND	ND
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentachlorobenzene	GC/EC	1	150	107	105	-	101	105
Process File			BP 109	BP 112	BP 114	-	BP 14B	BP 125
Extract Dilution			1:1	1:1	1:1	-	1:1	1:1
MRC Extraction Number	-		PCB 020	PCB 025	PCB 027	-	PCB 043	PCB 044
Sample Wt. Extracted (g)	-		1.009	1.004	1.003	-	0	0

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analysed.

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TABLE 3. (Continued)

Analyte	Analysis Method	L.O.D.[a]	Sample Identification: Method Blank	Method Blank				
			Concentration (µg/g)					
Aroclor 1248	GC/EC	1	ND	ND				
Aroclor 1254	GC/EC	1	ND	ND				
Aroclor 1260	GC/EC	1	ND	ND				
TOTAL AROCLOR	GC/EC	1	ND	ND				
Surrogate Spiking Compound	Analysis Method	Amount added (µg/g)	Recovery (%)					
Pentachlorobenzene	GC/EC	1	103	111				
Process File			BP 149	BP 150				
Extract Dilution			1:1	1:1				
NRC Extraction Number	-		PCB 045	PCB 046				
Sample Wt. Extracted (g)	-		0	0				

[a] L.O.D. = limit of detection in µg/g.

[b] ND = none detected with a detection limit given by the L.O.D. value for each compound.

[c] NA = not analysed.

sulfate were added and the samples were stirred, allowed to stand and stirred again. Samples were mixed again immediately prior to addition of extraction solvents. The extraction process involved the addition of 15 mL of methanol (all solvents are Burdick and Jackson "distilled in glass" grade), stirring and the subsequent addition of 150 mL of hexane. The samples were then shaken for 3 hours on a wrist action shaker and the extraction solvent removed. The solvent was then successively extracted with 50 mL of water, concentrated sulfuric acid (until clear), water, 20% potassium hydroxide and water. The hexane was then dried with 10 g of anhydrous sodium sulfate. Each sample was then placed on the head of a mixed phase column consisting of (top to bottom) 2 g of silica, 4 g of silica plus 40% sulfuric acid, 1 g of silica, 2 g of silica plus 36% potassium hydroxide and 1 g of silica. The column was eluted directly onto a column containing 2.5 g of Woelm basic alumina. The alumina column was first eluted with 10 mL of 2% methyene chloride/hexane (v/v) and this fraction discarded. An additional elution was made with 15 mL of a 50% methylene chloride/hexane (v/v) mixture to remove the 2,3,7,8-TCDD from the column.

For certain samples it was necessary to conduct further cleanup of the samples either by a HPLC cleanup used a Zorbax-ODS 25 cm by 4.6 mm ID column using methanol at 2.0 mL/minute as the eluting solvent. The eluate was collected in the 2,3,7,8-TCDD elution window and then extracted by adding 2 mL of 2% sodium bicarbonate to the methanol and extracting with 2 mL of hexane three times. Option D involved placing the samples on top of a column containing 18% Carbopack C on Celite packed to a depth of a 2 cm in a 1.0 cm ID pipet. The column was eluted with 1 mL of hexane, 1 mL of 1:1 cyclohexane in methylene chloride, 1 mL of 75:20:5 methylene chloride/methanol/benzene and finally with

2 mL of toluene. The toluene fraction was collected to be concentrated.

All samples has 50 µL of dodecane keeper added to them and then they were concentrated under a gentle stream of nitrogen and submitted for GC/MS analysis. The GC/MS analyses were conducted on Hewlett/Packard 5985B and 5987 GC/MS instruments. Samples that were not subjected to Option D cleanup were initially screened on a 30 m DB-5 capillary. Following HPLC cleanup any positives were then subjected to analysis on a 60 m SP2330 capillary column along with all samples that were prepared using Option D. The mass spectrometer was operated in the selected ion monitoring mode analyzing for ions characteristic of both the native (unlabeled) 2,3,7,8-TCDD (m/z 257, 320, 322), chlorine-37 labeled 2,3,7,8-TCDD (m/z 328) and carbon-13 labeled 2,3,7,8-TCDD (m/z 332, 334).

3.3.2 STANDARDS

Standard solutions were prepared from standards that had been cross validated with a standard provided as a check sample by the EPA. Concentration of the internal standards conformed to the levels specified by the method.

3.3.3 RESULTS

The results of the analyses of the samples are given in table 5. The table also gives all pertinent QA/QC information.

3.4 MERCURY ANALYSES

The analysis for mercury concentrations were conducted in accordance to the CO^1 vapor atomic absorption technique (1).

TABLE 4. ANALYTICAL RESULTS FOR KRUMBRICH PLANT SAMPLES FOR TOC AND TOTAL PHENOL

Sample ID	TOC, ng/g	Total Phenol, ng/g
Lagoon sludge	17.1	<0.071
Sample No. 1	4.6	<0.39
Sample No. 2	4.1	<0.44
Sample No. 3	7.6	<0.32

QUALITY CONTROL DATA

Reference Standards	Observed Value, µg/g	True Value, µg/g	Percent Recovery
PCS 35179 TOC	24.9	25.0	100
PCS 162 Phenol	95	100	95

TABLE 5. 2,3,7,8-TCDD DATA REPORT

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Sample	Extraction Method	Cleanup Option	Grams Ext. Weight	ppb TCDD	D.L.	Date	Time	130/ 132	331/ 196	Surrogate Percent Recovery	320	322	351	328*	332	334	Comments
SA-01 0-2"	J	B,C,M	10.69	ND	0.1	7/29	1500	1.0	0.86	119	72	80	9	609	1530	1780	
SA-02 0-2"	J	B,C	11.56	ND	0.1	7/22	0015	-	0.68	116	3	8	1106	1904	1119	0952	80-5
SA-03 0-2"	J	B,C	10.09	ND	0.1	7/21	1700	0.55	0.91	96	79	161	212	1229	2988	3516	80-5
SA-03 0-2"R	J	B,C	11.07	ND	0.1	7/21	1755	0.89	0.77	82	56	63	121	1010	2700	1566	80-5
SA-04 0-2"	J	B,C,M	10.67	ND	0.1	8/1	1543	-	0.81	120	0	0	0	372	559	692	
SA-05 0-2"	J	B,C,M	11.17	ND	0.5	7/29	1340	-	0.86	105	0	0	0	351	883	1022	
SA-06 0-6"	J	B,C,M	11.06	ND	0.2	7/29	1520	1.5	0.87	122	66	80	0	519	1277	1501	
SA-07 0-2"	J	B,C,M	11.48	ND	0.2	7/29	1541	-	0.85	112	0	0	0	881	1875	2205	
SA-08 0-2"	J	B,C,M	10.54	ND	0.1	8/1	0725	0.91	0.83	129	25	27	0	661	1809	2214	
SA-09 0-2"LS	J	B,C,M	11.63	0.9	-	8/1	1205	0.75	0.79	220	1137	1499	557	7042	5604	7261	0.9 ppb added
SA-09 0-2"	J	B,C,M	11.22	0.5	-	8/1	2205	0.71	0.83	823	780	264	92	882	1791	2102	
SA-09 0-2"R	J	B,C,M	10.82	ND	0.8	8/2	0707	1.1	0.80	139	35	31	0	95	674	713	
SA-10 0-2"	J	B,C	11.03	ND	0.1	8/2	1100	0.65	0.80	149	83	20	0	4030	2290	2130	
SA-11 0-2"	J	B,C	10.11	ND	0.3	7/24	2345	-	0.77	68	0	0	0	781	2969	2511	
SA-12 0-2"	J	B,C	11.46	ND	0.1	7/21	2005	0.76	0.81	118	6	31	76	6006	2036	2570	80-5
SA-13 0-2"	J	B,C	10.82	ND	0.1	7/27	0002	-	0.78	110	0	0	0	8359	2672	5607	
SA-14 0-2"	J	B,C,M	10.70	ND	0.1	8/2	0002	-	0.78	127	11	0	0	201	801	516	
SA-15 0-2"	J	B,C	11.00	ND	0.5	7/22	0943	-	0.81	113	-	-	54	793	1422	2007	80-5
SA-16 0-2"	J	B,C,M	10.91	ND	0.2	8/1	1520	-	0.73	110	0	0	0	298	826	1130	
SA-16 0-2"LS	J	B,C	10.37	1.2	-	7/23	2200	0.95	0.78	100	1111	1489	495	8058	4268	5430	80-5
SA-17 0-2"	J	B,C	10.66	ND	0.2	7/23	1730	-	0.80	137	0	0	0	1048	1823	2018	80-5
SA-18 0-2"	J	B,C,M	10.80	ND	0.1	8/1	0530	-	0.81	128	0	0	0	135	677	820	
SA-19 0-2"	J	B,C,M	11.62	2.0	-	7/29	0642	0.69	0.87	113	596	858	179	537	2266	1661	
SA-20 0-2"	J	B,C,M	10.91	ND	0.1	8/1	1200	0.20	5.01	120	60	201	0	621	831	1007	
SA-20 0-2"RD	J	B,C,M	11.01	10	-	8/2	0743	0.80	0.82	134	566	599	175	689	711	256	0.1 ppb added
SA-21 0-2"	J	B,C	10.32	ND	0.1	7/31	0225	0.80	0.81	123	88	60	159	1330	2604	3050	80-5
SA-21 0-2"MS	J	B,C	11.01	5.5	-	7/31	2355	0.77	0.71	77	8312	8231	2649	1004	3012	5871	80-5 0.1 ppb added
SA-22 0-2"	J	B,C	10.76	ND	0.1	7/25	1645	-	0.77	107	0	0	18	1116	2100	2003	80-5
SA-22 0-2"	J	B,C	10.37	ND	0.1	7/23	2055	-	0.82	100	0	0	90	1159	1956	1260	80-5
SA-04	J	B,C	-	ND	0.1	7/23	1535	-	-	-	0	0	0	0	0	0	80-5 No internal standard added
Method Blank	J	B,C,M	-	ND	0.1	8/1	1635	-	0.80	100	3	0	0	606	1001	1005	
Method Blank	J	B,C,M	-	ND	0.0	8/2	0020	-	0.83	120	0	0	0	297	615	701	
SA-09 2-8"	J	B,C,D	10.03	0.0	-	10/10	9211	0.72	0.88	96	1362	1910	356	87036	53009	81640	
SA-09 6-6"	J	B,C,D	10.66	0.1	-	10/10	0220	0.75	0.79	89	691	926	379	18682	87208	59131	
SA-09 6-8"	J	B,C,D	10.18	ND	0.1	10/10	0040	-	0.79	99	0	0	6	23484	53466	67983	
SA-09 6-8"D	J	B,C,D	10.30	ND	0.1	10/10	0301	-	0.77	100	0	369	0	16356	38166	38998	
SA-09 8-10"	J	B,C,D	10.21	ND	0.1	10/10	0535	-	0.78	91	0	992	0	26580	85402	85235	
SA-19 2-8"	J	B,C,D	10.02	3.9	-	10/10	3320	0.72	0.83	88	38858	20282	5103	7670	38347	22838	
SA-19 2-8"LS	J	B,C,D	10.03	3.0	-	10/19	1227	0.88	0.75	87	26698	68499	38829	13113	37886	66198	0.9 ppb added
SA-19 6-6"	J	B,C,D	10.36	9.0	-	10/19	1350	0.62	0.76	72	15889	25867	5812	2876	8685	11678	
SA-19 6-8"MS	J	B,C,D	10.03	22	-	10/19	1617	0.77	0.77	65	76888	99375	26498	8796	16458	21379	9.2 ppb added
SA-19 6-8"	J	B,C,D	10.00	6.9	-	10/19	1833	0.79	0.88	113	38588	38591	11385	6987	14863	17681	
SA-19 8-8.5"	J	B,C,D	10.20	0.6	-	10/19	1851	0.73	0.79	79	27982	81466	9884	8618	23889	31877	
Method Blank	J	B,C,D	-	ND	0.1	10/20	1818	-	0.82	95	0	0	0	20425	69819	68463	

[a] Corrected for contribution by native TCDD (Subtract 0.009 of m/e 3221

[b] Based on 40 gram sample

D = Duplicate
LS = Low Spike
MS = High Spike
ND = Not Detected
DL = Detection Limit
J = Jar

B,C,D = Cleanup Option
D = HPLC Cleanup

Column to 502330 unless noted

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TABLE 6. RESULTS OF ANALTSIS OF KRUMRICH SOIL SAMPLES FOR MERCURY

Sample ID	(µg/gram) PPM			Sample ID	(µg/gram) PPM
KR01	11.6[a]	(9.5)	(13.7)	KR14	0.9
KR02	2.0			KR15	0.3
KR03	8000.0			KR16	<0.3
KR04	13.6			KR17	<0.3
KR05	3.1			KR18	<0.3
KR06	1.5			KR19	6.4
KR07	1.4			KR20	0.8
KR08	10.9			KR21	1.1
KR09	7.8			KR22	<0.8
KR10	<.3			KR23	0.8
KR11	1.3	(0.2)	(0.3)		
KR12	<0.3				
KR13	0.3[a]				

[a]Results for (KR01) and (KR13) are averaged values from duplicate samples analysis

QC DATA

1. QC REFERENCE: Recovery- 97 and 96-
2. SAMPLE SPIRE (KR06) Recovery 86%

After Digestion (KR20) Recovery 71%

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REFERENCES

1. U.S. EP Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, March 1979