

KERR-McGEE CHEMICAL CORPORATION

Technical Memorandum

**Predesign Task 1
Rapid Turnaround Analysis of CPAHs in Soils
and Sediments**

**Moss-American Site
Milwaukee, Wisconsin**

November 1994



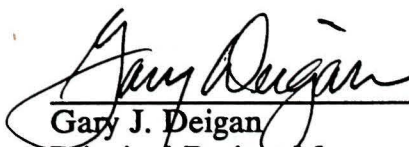
**TECHNICAL MEMORANDUM
PREDESIGN TASK 1
RAPID TURNAROUND ANALYSIS OF
CPAHS IN SOILS AND SEDIMENTS**

Prepared for

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November 1994

Work Order No. 02687-007-002



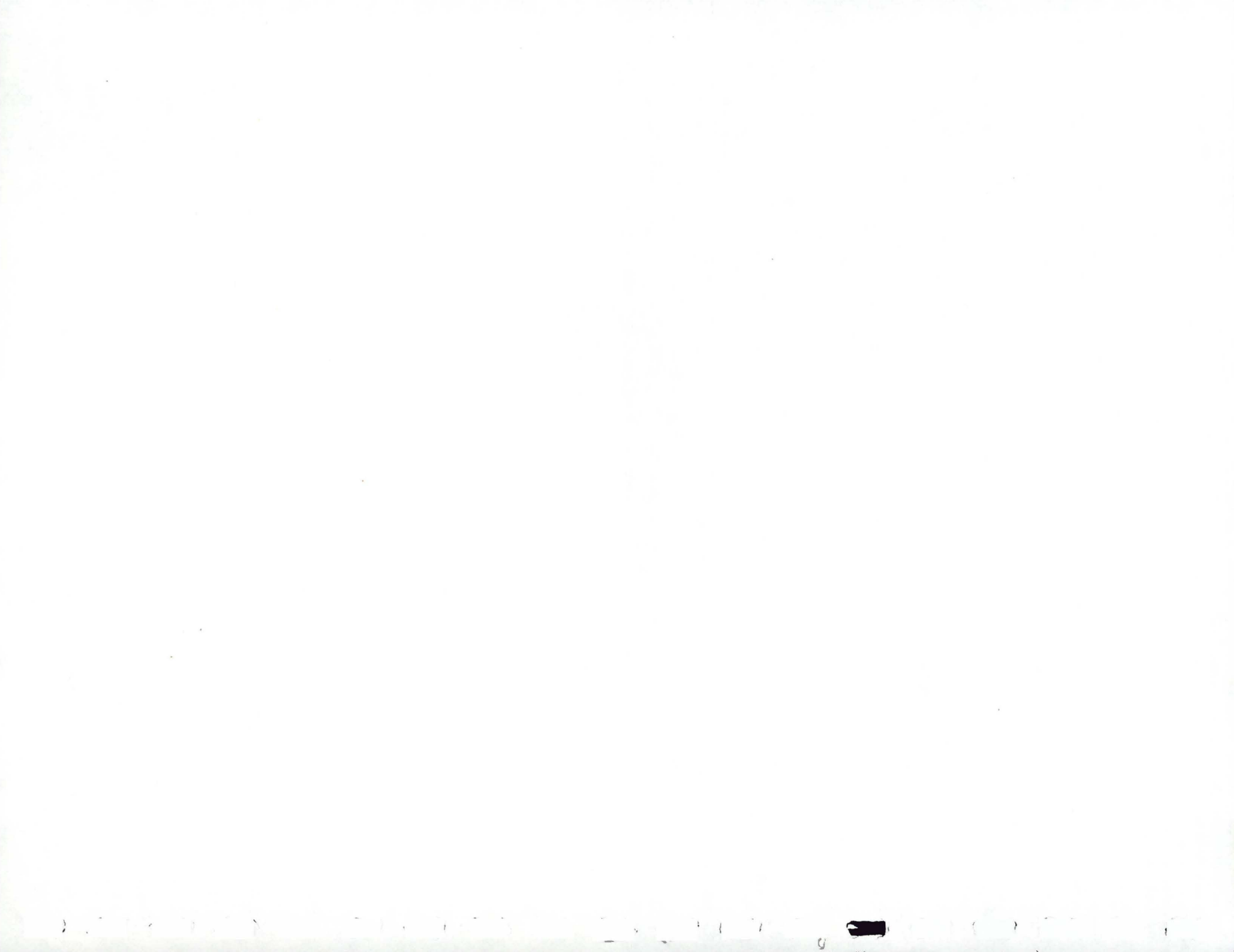
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SECTION 1 SCOPE AND OBJECTIVES

Predesign Task 1 for the Moss-American facility was specified to refine or develop an analytical procedure to measure carcinogenic polycyclic aromatic hydrocarbon (CPAH) concentrations on a rapid-turnaround basis. The objective of this task, as stated in the Consent Decree Statement of Work (SOW), is to:

"develop a new field screening procedure for quantifying the concentration of CPAHs with accuracy and detection limits that correlate to the cleanup standards. The new field screening procedure may involve either a direct measurement of CPAHs or a surrogate measurement which is demonstrated to correlate reliably with the CPAHs."

The following field screening methods were identified in the October 1992 Predesign Work Plan as potential candidates for use at the Moss-American site: ultraviolet absorbance, ultraviolet fluorescence, enzyme-linked immunoassay, total extractable organic carbon, and infrared absorbance. An enzyme-linked immunoassay soil test marketed by EnSys, Inc., was chosen as the rapid-turnaround field screening test to be evaluated during the Predesign Phase work at the site. The EnSys test was chosen for use based on its relatively low cost, the relative simplicity of the test method, and the expected high accuracy and reproducibility of the test results. The EnSys test method for polycyclic aromatic hydrocarbon (PAH) analysis has been approved for inclusion in the third update of Test Methods for Solid Waste, SW-846, under U.S. EPA Draft Method 4035.

Under Predesign Task 1 KMCC is also evaluating automated sample extraction systems linked to field laboratory analysis of CPAHs by gas chromatography (GC) or high performance liquid chromatography (HPLC). When completed, this work will be presented to U.S. EPA in a separate deliverable.

The EnSys test is designed to measure the total PAH concentration in a sample. However, the soil and sediment cleanup standards at the Moss-American site are currently established based on total CPAHs. The following 16 PAHs are included on U.S. EPA's Target Compound List (TCL) and typically analyzed for using U.S. EPA Methods 8270 (GC/MS) or 8310 (HPLC):

- | | |
|------------------|---------------------------|
| • Naphthalene | • Benzo(a)anthracene* |
| • Acenaphthylene | • Chrysene* |
| • Acenaphthene | • Benzo(b)fluoranthene* |
| • Fluorene | • Benzo(k)fluoranthene* |
| • Phenanthrene | • Benzo(a)pyrene* |
| • Anthracene | • Dibenzo(a,h)anthracene* |
| • Fluoranthene | • Benzo(g,h,i)perylene* |
| • Pyrene | • Indeno(1,2,3-cd)pyrene* |

The chemicals in the second column (marked with an asterisk) are categorized by U.S. EPA as CPAHs. Thus, CPAHs represent a subset of PAHs. Typically, total CPAH concentrations in samples from the Moss-American site represent approximately 10 to 30 percent of the total PAH concentrations.

WESTON analyzed 20 soil and 19 sediment samples for total PAHs in a field setting using the EnSys test. These results were then compared with the analytical results obtained by a fixed, commercial laboratory for the same samples. The sediment and soil samples used in the EnSys testing were collected during Predesign Tasks 4 and 5, respectively. The details of the sample collection procedures are contained in the Technical Memorandum (November 1994) for these tasks. In all cases where a sample was collected for EnSys testing, the sample was homogenized in the field with the sample scoop and a split was taken, with part being retained for the EnSys test and part being shipped overnight to Lancaster Laboratories, Inc. for analysis. All of the samples for EnSys analysis and fixed laboratory analysis were stored at 4 degrees Celsius prior to analysis, and were analyzed within 14 days of collection.

SECTION 2

THE ENSYS TEST

2.1 ENSYS TEST METHOD

The purpose of this subsection is to provide a brief discussion and overview of the EnSys test method. The first step in the procedure is to extract 10 grams of investigative sample in an aqueous methanol solution. The extract is then pipetted off and filtered in a small disposable filtration apparatus. Next, serial dilutions are prepared from the filtered sample extract. The dilution vials are prepared prior to shipment by EnSys, and the detection levels provided are based on site requirements. For the soil samples at the Moss-American site, detection levels of 1, 10, 100, and 500 parts per million (ppm, equivalent to mg/kg) were used; for the sediment samples, detection levels of 1, 10, and 50 ppm were used. Each of these detection levels corresponds to a total PAH concentration level at which the sample may be tested. The result of the EnSys test is not a concentration value, but rather a "yes/no" answer to whether the total PAH concentration in the sample exceeds a certain predetermined level (which is the detection level being tested). Soil test kits currently supplied by EnSys have a minimum detection limit of 1 ppm total PAHs.

After the dilution step, 30 μL aliquots of diluted investigative samples are pipetted into prepared vials of a buffer solution. Also, two 30 μL aliquots of PAH standard are pipetted into additional prepared buffer tubes. A small amount of enzyme is added to each of the buffer tubes, and then each buffer solution plus enzyme and investigative sample (or PAH standard) is poured into a separate reaction tube coated with PAH antibodies for a 10 minute incubation. During this incubation step, a competitive binding reaction occurs between the enzyme molecules and the PAH molecules (if any) in the sample. That is, the enzyme molecules compete with the PAH molecules for the limited number of binding sites on the antibodies attached to the reaction tube. The higher the concentration of PAHs in



the sample, the fewer enzyme molecules will be bound to the antibodies on the reaction tube at the end of the incubation period.

After the incubation period is over, the reaction tubes are rinsed with a mild detergent solution, and then a substrate solution is added that will produce a blue colored product when acted upon by any enzyme molecules bound to the tube. The enzyme-substrate reaction is stopped with a dilute acid at the end of two and one-half minutes, and the blue solution turns yellow. If the concentration of PAHs in the sample is high, there will be little enzyme bound to the reaction tube at the end of the incubation step, and therefore little subsequent color development. The test result is obtained using a simple photometer to compare the color intensity of the investigative sample to the color intensity of the PAH standard. While the two PAH standard samples prepared are expected to be nearly equal in color intensity, the darker of the two PAH standard samples is selected for comparison with the investigative sample. If the investigative sample color is equal to or lighter than the standard, then the result is positive (i.e., PAHs are present at a concentration equal to or greater than the detection level tested). If the investigative sample color is darker than the standard, then the result is negative (i.e., total PAHs do not exceed the detection level tested). If, based on the results of the initial analysis, additional detection levels for the investigative sample are of interest, then 30 μ L aliquots of filtered sample extract from the desired dilutions are pipetted into buffer tubes and the incubation and color development steps are repeated. Two new PAH standards are incubated with every set of investigative samples tested.

2.2 ENSYS QUALITY CONTROL

The quality control check in the test method is the duplicate PAH standards that are run with each sample set. At the end of the color development step, these two standards are compared photometrically. A photometer reading of greater than 0.25 (absolute value) is outside QC limits and is unacceptable. If this occurs, the analysis must be repeated. For

the Moss-American site samples, the photometer readings for each pair of standards were in the range from 0.00 to 0.15, and thus were acceptable.

Field duplicate analyses of the EnSys test were performed on one soil and one sediment sample. The soil sample duplicates (fixed laboratory result = 6.9 mg/kg total PAHs) yielded EnSys test results that were not identical (1-10 and 10-100 mg/kg total PAHs). The sediment sample duplicates (fixed laboratory result = 172 mg/kg total PAHs) yielded EnSys test results that were identical (\geq = 50 mg/kg total PAHs).

2.3 PRACTICAL ASPECTS OF PERFORMING THE TEST

The EnSys test is fairly easy to perform, but practice does make the analyst more efficient. It does not involve any complicated laboratory methods, and an individual with some college-level chemistry or biology laboratory experience should be able to perform it effectively.

As purchased, each of the EnSys test kits contains the materials needed to extract and analyze four soil/sediment samples. Therefore, four samples is a convenient number to analyze in one set. Five or six samples is probably a reasonable maximum number to analyze together. Every set of samples analyzed requires the analysis of two standards as well.

When analyzing several samples together, it is efficient to analyze all of the samples at only one detection level each (although not necessarily the same level), and then to reanalyze at different dilutions based on the results of the first analysis (e.g., if a sample is tested at 10 ppm and the result is negative, then it may be desirable to retest at 1 ppm to produce as accurate a result as possible). This keeps the number of sample tubes being handled at any one time to a manageable number (a reasonable maximum of seven or eight, including standards).

An analyst with minimal experience should be able to weigh out, extract, and analyze a set of four samples in approximately two to three hours. The time estimate allows for analysis of more than one detection level per sample, and documentation of results. An experienced analyst can obtain results for four samples, analyzed for a single detection level, in approximately 45 minutes.

SECTION 3 FINDINGS AND DISCUSSION

Because of the difference between total PAHs, which the EnSys test is designed to measure, and total CPAHs, which the Moss-American cleanup standards are based on, the EnSys test was evaluated on its ability to predict both total PAH levels and total CPAH levels in the soil and sediment samples at the site. In evaluating the EnSys test results, it was assumed that the sample results obtained from the fixed analytical laboratory were accurate. The EnSys result for a particular sample was categorized as "correct" if it agreed with the fixed laboratory result and "incorrect" if it did not. If the EnSys result was incorrect, it was further categorized as either being a false positive (indicating the presence of PAHs at a higher level than the fixed laboratory found) or a false negative (indicating PAHs were not present above a certain level while the fixed laboratory did find PAHs above that level).

The fixed laboratory analytical results for the soil and sediment samples analyzed using the EnSys test are presented in Appendix A. Since the EnSys test reports results on an "as tested" (wet weight) basis, comparisons to fixed laboratory results were performed using "as received" PAH values reported by the fixed laboratory (wet weight).

3.1 SOILS

The results of the EnSys test on soil samples are summarized in Table 3-1. Total PAH values for the data from the fixed laboratory were calculated by summing the individual PAH values for a sample (including nondetected PAHs at one-half of the sample quantitation limit). Ensys results are presented as:

- Greater than or equal to a detection limit (e.g., \geq = 500 ppm).
- Less than a detection limit (e.g., < 1 ppm).

Table 3-1

**EnSys Results Compared with Laboratory Analytical Results for Site Soil Samples
Moss-American Site
Milwaukee, Wisconsin
(All Concentrations in mg/kg)**

Sample Code (Coordinate)	EnSys Result (Total PAHs)	Total PAHs ¹		Notes
		Laboratory Result ²	Agrees With EnSys? ³	
0N-2550E-01 (0N-2550E)	≥ 500	14,000	Yes	Black, moist soil; uniform color, consistency; strong odor
665N-1490E-01 (665N-1490E)	≥ 500	3,400	Yes	Dark brown soil with small gravel and stones; strong odor
300N-1050E (300N-1050E)	10 - 100	130	No	Yellowish to dark brown clay; color not uniform; strong odor
380N-1270E-01 (380N-1270E)	10 - 100	6.9	No	Medium brown to dark brown clay; color not uniform; no odor
380N-1270E-01 ⁴ (380N-1270E)	1 - 10	6.9	Yes	Medium brown to dark brown clay; color not uniform; no odor
273N-524E (273N-524E)	1 - 10	9.6	Yes	Reddish-brown to dark brown clay with fine gravel; not uniform; no odor
273N-473E (273N-473E)	< 1	7.7	No	Reddish-brown to dark brown moist clay; color not uniform; no odor
485N-552E-01 (485N-552E)	1 - 10	160	No	Medium brown clay with small gravel; odor present
300N-1350E-02 (300N-1350E)	1 - 10	4.9	Yes	Light brown moist clay; uniform consistency; no odor
485N-552E-02 (485N-552E)	10 - 100	9.6	Yes	Grayish moist clay with small gravel; no odor
500N-1500E-01 (500N-1500E)	≥ 500	2,800	Yes	Dark brown moist soil mixed with fine gravel; strong odor
MA1-SSG38-1105-01 (1200N-3000E)	1 - 10	11	No	Gray clay; uniform; no odor

3-2

Table 3-1

**EnSys Results Compared with Laboratory Analytical Results for Site Soil Samples
Moss-American Site
Milwaukee, Wisconsin
(All Concentrations in mg/kg)
(Continued)**

Sample Code (Coordinate)	EnSys Result (Total PAHs)	Total PAHs ¹		Notes
		Laboratory Result ²	Agrees With EnSys? ³	
MA1-SSG32-1103-01 (600N-3000E)	< 1	4.5	No	Reddish-brown clay; no odor
0N-2500E (0.5-3.5') (0N-2500E)	≥ 500	9,900	Yes	Black, moist soil; uniform consistency; strong odor
75N-900E-01 (75N-900E)	100 - 500	130	Yes	Medium brown to light brown moist clay; mild odor
MA1-SSG30-0903-01 (600N-2400E)	< 1	4.6	No	Medium brown to dark brown clay; not uniform; no odor
MA1-SSG37-1004-01 (900N-3000E)	10 - 100	52	Yes	Medium brown moist clay; uniform consistency; odor present
MA1-SSG31-1003-01 (600N-2700E)	< 1	4.5	No	Brown clay; uniform consistency; mild odor
500N-900E (500N-900E)	1 - 10	20	No	Brown soil; no odor
75S-600E-01 (75S-600E)	10 - 100	64	Yes	Dark brown moist clay; mild odor
75S-900E (75S-900E)	100 - 500	500	Yes	Medium brown moist clay; uniform consistency; mild odor

¹See Subsection 3.3 for discussion of relationship between total PAHs and total CPAHs in site soil samples.

²As received (wet weight) basis. Total includes nondetects at 1/2 of reporting limit.

³A discrepancy of plus or minus 5 percent is allowed due to numerical rounding.

⁴EnSys duplicate sample.

- Within two detection limits (e.g., 1 - 10 ppm, which is equivalent to ≥ 1 and < 10 ppm).

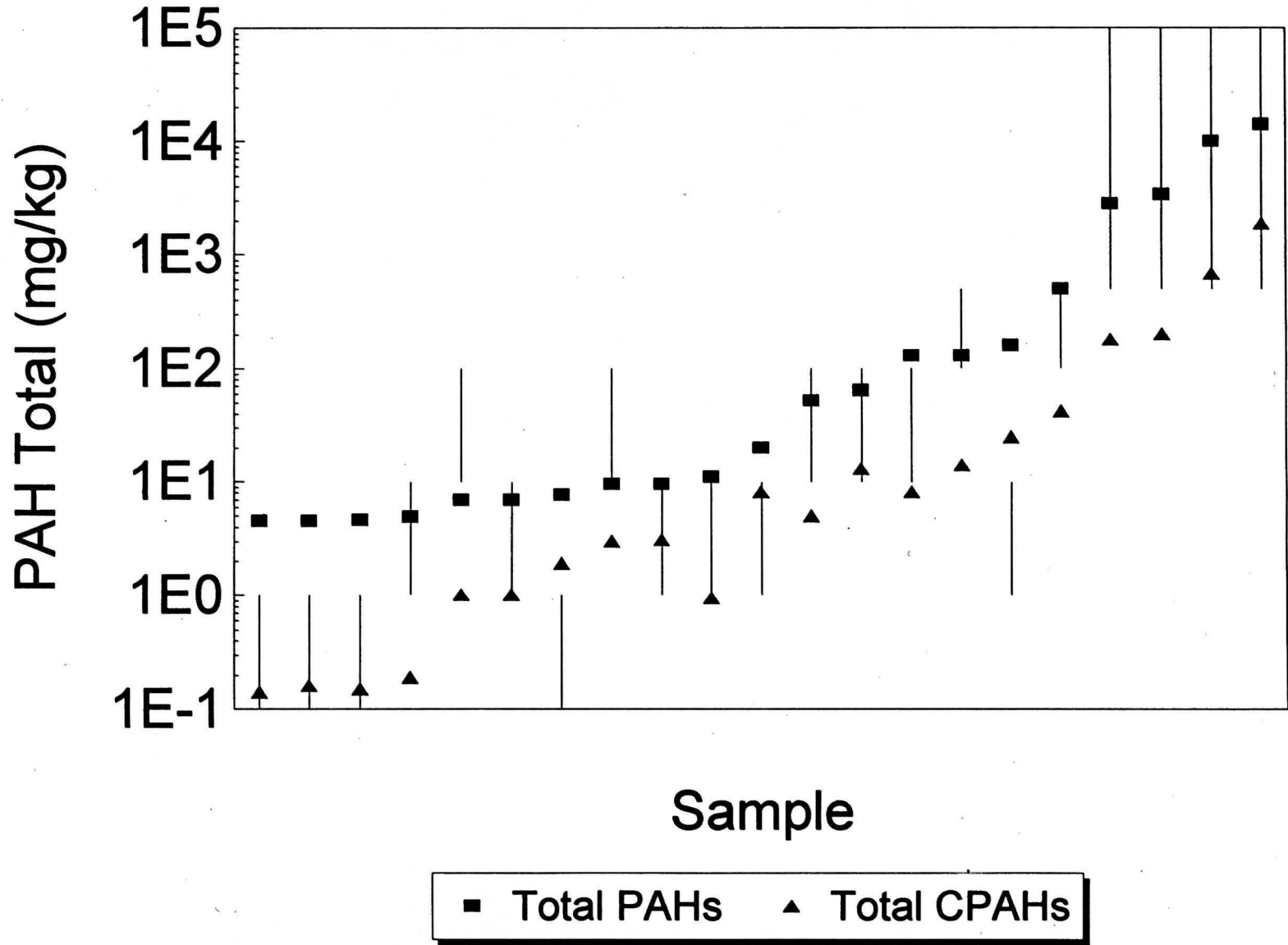
For the total PAH comparison, a strict interpretation of the results presented in the table shows that the EnSys test correctly predicted the fixed laboratory result for 12 out of 21 samples (20 investigative samples plus 1 duplicate), or 57 percent. A less strict interpretation of the results (considering EnSys to be correct if it predicted the laboratory result within plus or minus 50 percent, which is a reasonable concession given the nonhomogeneous nature of soil matrices), shows that the EnSys test correctly predicted the laboratory result for 76 percent of the samples. Under this less strict interpretation, EnSys gave 16 correct results and five false negative results.

The results presented in Table 3-1 are also represented in graphical form in Figure 3-1. In order to include a wide range of analytical results, the data are presented on a logarithmic scale (with the Y-axis ranging from 0.1 mg/kg to 100,000 mg/kg). The data for each sample includes a vertical line representing the EnSys test result and two symbols representing the fixed laboratory results for total PAHs (squares) and total CPAHs (triangles). The analytical data were sorted by total PAH levels and presented along the X-axis with increasing total PAHs. Agreement between the fixed laboratory results and the EnSys test results is observed when the symbols (squares or triangles) are superimposed on the vertical lines. The results of the EnSys soil testing indicate that the EnSys test performed well in predicting the fixed laboratory result for total PAHs.

3.2 SEDIMENTS

The results of the EnSys test on sediment samples are summarized in Table 3-2 and indicate that, for total PAHs, the EnSys test correctly predicted the laboratory result for 19 out of 20 samples (19 investigative plus 1 duplicate), or 95 percent. For the one sample for which

Fixed Lab vs. EnSys - Soils



3-5

FIGURE 3-1

Table 3-2

**EnSys Results Compared with Laboratory Analytical Results for Little Menomonee River Sediment Samples
Moss-American Site
Milwaukee, Wisconsin
(All Concentrations in mg/kg)**

Sample Code	EnSys Result (Total PAHs)	Total PAHs ¹		Notes
		Laboratory Result ²	Agrees With EnSys? ³	
MA1-SD03-0005-01	≥50	294	Yes	Odor
MA1-SD03-0008-01	≥50	33.3	No	
MA1-SD03-0021-01	≥50	60.9	Yes	
MA1-SD02-0002-01	≥50	177	Yes	Slight odor
MA1-SD02-0004-01	≥50	1,050	Yes	Odor, sheen
MA1-SD02-0007-01	≥50	426	Yes	Slight odor
MA1-SD02-0009-01	≥50	932	Yes	Slight odor; sample filtered to remove excess moisture
MA1-SD02-0010-01	≥50	89.7	Yes	Odor
MA1-SD02-0015-01	≥50	56.7	Yes	Odor
MA1-SD02-0017-01	≥50	255	Yes	Slight odor, slight sheen
MA1-SD01-0002-01	≥50	503	Yes	
MA1-SD01-0004-01	≥50	205	Yes	Odor, sheen
MA1-SD01-0008-01	≥50	2,480	Yes	Strong odor, sheen
MA1-SD01-0015-01	≥50	172	Yes	Slight odor
MA1-SD01-0015-01	≥50	172	Yes	Duplicate EnSys analysis
MA1-SD01-0016-01	≥50	226	Yes	Odor
MA1-SD01-0017-01	10 - 50	14.4	Yes	
MA1-SD01-0018-01	≥50	139	Yes	Odor
MA1-SD01-0019-01	≥50	218	Yes	Odor, sheen
MA1-SD01-0020-01	≥50	254	Yes	Odor

¹See Subsection 3.3 for discussion of relationship between total PAHs and total CPAHs in sediment samples.

²As received (wet weight) basis. Total includes nondetects at 1/2 of reporting limit. All laboratory analyses by Method 8310.

³A discrepancy of plus or minus 5 percent is allowed due to numerical rounding.

EnSys gave a false positive result, the EnSys result was within plus or minus 50 percent of the laboratory result.

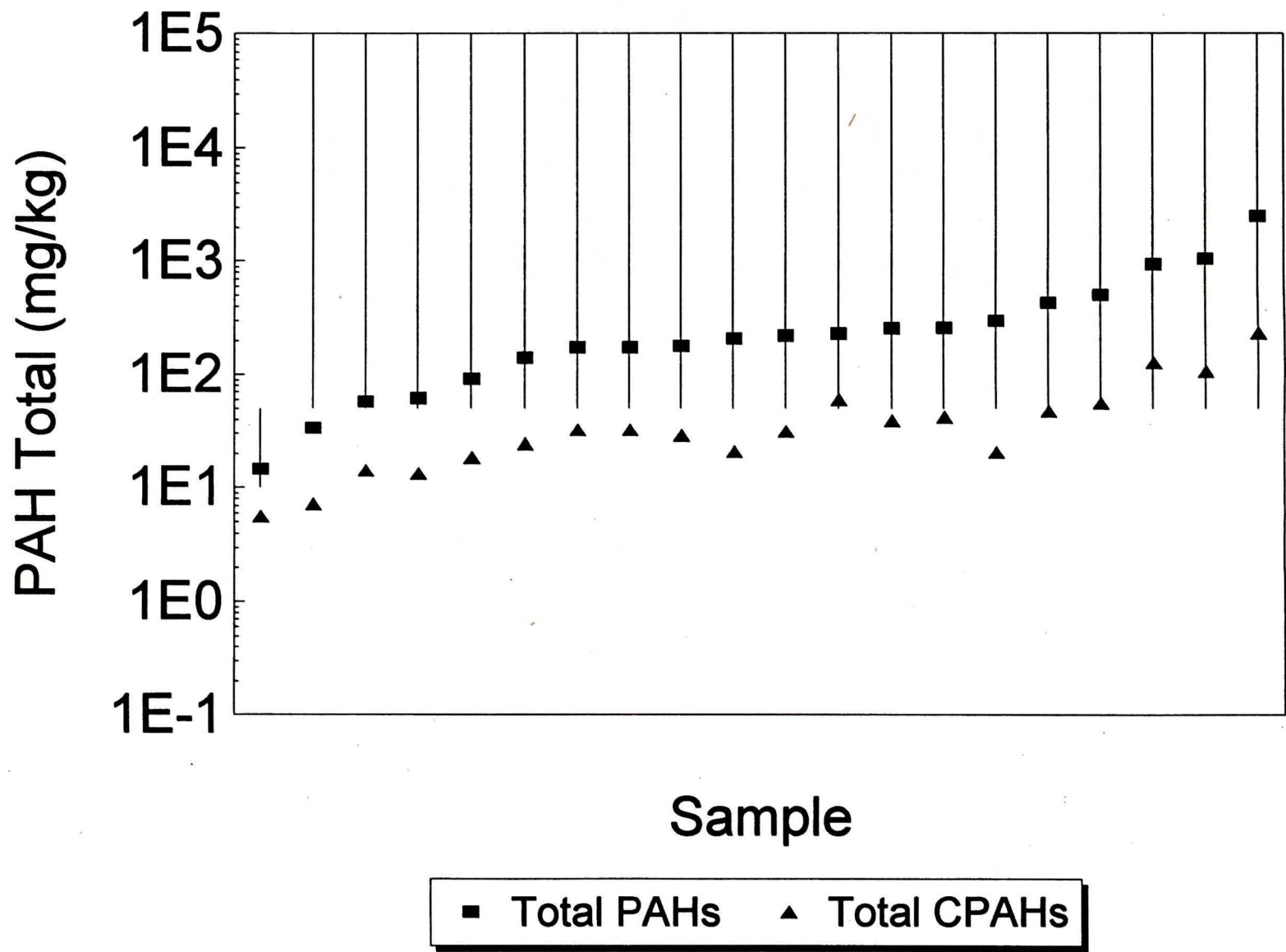
The results presented in Table 3-2 are also provided in graphical form in Figure 3-2. In order to include a wide range of analytical results the data are presented on the same logarithmic scale as was used for Figure 3-1. The data for each sample includes a vertical line representing the EnSys test result and two symbols representing the fixed laboratory results for total PAHs (squares) and total CPAHs (triangles). The analytical data were sorted by total PAH levels and presented along the X-axis with increasing total PAHs. Agreement between the fixed laboratory results and the EnSys test results is observed when the symbols (squares or triangles) are superimposed on the vertical lines.

The results of the EnSys sediment testing indicate that the EnSys test performed well in predicting the fixed laboratory result for total PAHs. In retrospect, it may have proven more useful to obtain sediment samples exhibiting a wider range of total PAH levels, if available.

3.3 RELATIONSHIP OF TOTAL CPAHS TO TOTAL PAHS

While the EnSys test did not prove to be a reliable direct predictor of total CPAHs, its success as a direct measurement of total PAHs will support its use as a surrogate measurement of total CPAHs. Approximately 230 samples of soils and sediments at the Moss-American site were analyzed for PAHs and CPAHs under Predesign Tasks 4 and 5 (see Technical Memorandum dated November 1994). The analytical results for all of these samples are plotted in Figure 3-3, where the total CPAH is plotted versus the total PAH for each sample. The data for soils and sediments appears to overlap sufficiently to support combining them into a single data set. The data representing samples with total PAHs less than 10 mg/kg (1E1) are more widely scattered than the rest of the data. In addition, soils and sediments with less than 10 mg/kg total PAHs are not likely to be of concern during

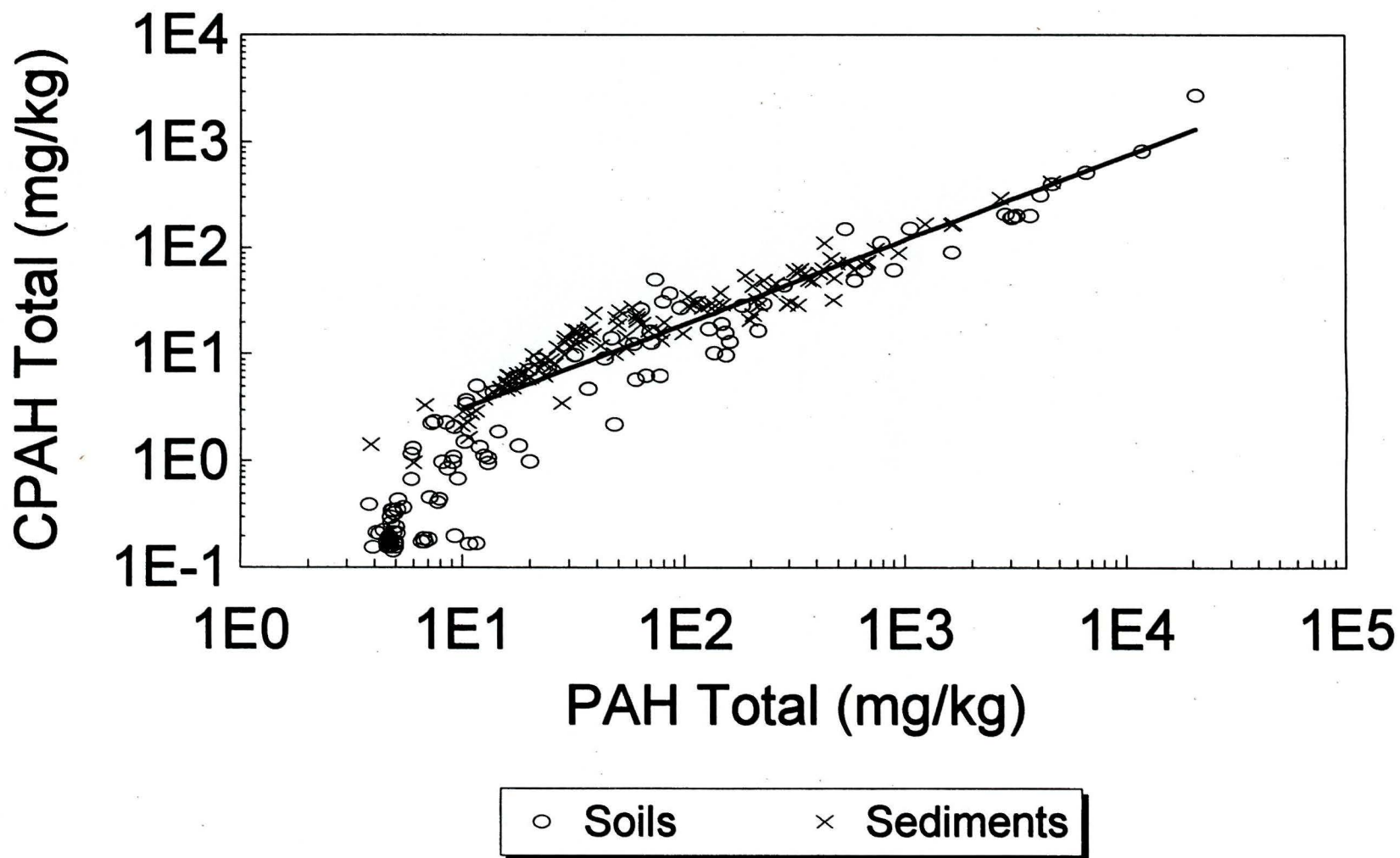
Fixed Lab vs. EnSys - Sediments



3-8

FIGURE 3-2

Relationship of CPAHs to PAHs in Soils
& Sediments - Moss-American Site
(Logarithmic Scale)



subsequent remedial design/remedial action phases of this project. Therefore, data from samples with less than 10 mg/kg total PAHs were excluded from further analysis.

Linear regression was performed on the log-transformed data for samples with total PAHs > 10 mg/kg (number of samples included = 172). The following relationship was obtained:

$$\log (\text{CPAH}) = \log (\text{PAH}) \times (0.7942) - 0.309$$

Where:

$$\text{CPAH} = \text{CPAH Total (mg/kg)}$$

$$\text{PAH} = \text{PAH Total (mg/kg)}$$

This linear relationship (on a logarithmic scale) is illustrated by the straight line segment in Figure 3-3 (correlation coefficient = 0.915). The predicted relationship between CPAHs and PAHs is given below:

<u>Measured PAH Total</u> <u>(mg/kg)</u>	<u>Estimated CPAH Total</u> <u>(mg/kg)</u>	<u>Estimated CPAH/PAH</u> <u>Ratio</u>
10	3.06	0.31
100	19.0	0.19
1,000	118	0.12
10,000	738	0.074

Thus, by measuring total PAHs in soil or sediment at the Moss-American site, a reasonable prediction of CPAH concentration can be obtained from the above equation.

SECTION 4 CONCLUSIONS

The EnSys test is reasonably effective at predicting total PAH concentrations in soils and sediments at the Moss-American site. The test is limited in its ability to directly predict total CPAH concentrations in the soils and sediments; however, it is possible to use the test to measure total PAHs as a surrogate measurement of CPAHs. The large volume of soil and sediment samples analyzed by the fixed laboratory has provided a reliable correlation between PAHs and CPAHs in soils and sediments.

The EnSys test may have several advantages for use at the Moss-American site in the future:

- It can be expected to give an accurate prediction of the total CPAH level in soil or sediment samples when used as a surrogate method.
- It gives a rapid result.
- The test method is relatively simple to perform in the field.
- The test can be set to a variety of numeric standards with potential application for determining material requiring remediation.

APPENDIX A

FIXED LABORATORY ANALYTICAL RESULTS

LLI Sample No. SW 2147685

Collected: 6/22/94 at 13:45 by DW

Submitted: 6/23/94 Reported: 8/ 5/94

Discard: 9/ 5/94

75S-900E Soil Sample

Moss American

(Odor)

79005 SDG#: MOS06-14

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
Base Neutrals (SW846/8270A)						
3761	naphthalene	62,000.	17,000.	ug/kg	72,000.	20,000.
3765	acenaphthylene	480.	330.	ug/kg	550.	380.
1191	acenaphthene	55,000.	17,000.	ug/kg	64,000.	20,000.
3768	fluorene	56,000.	17,000.	ug/kg	66,000.	20,000.
3775	phenanthrene	130,000.	17,000.	ug/kg	160,000.	20,000.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jon S. Kauffman, Ph.D.
 Group Leader, GC/MS

57



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

See reverse side for explanation of symbols and abbreviations



* 2216

LLI Sample No. SW 2147685

Collected: 6/22/94 at 13:45 by DW

Submitted: 6/23/94 Reported: 8/ 5/94

Discard: 9/ 5/94

75S-900E Soil Sample

Moss American

(Odor)

79005 SDG#: MOS06-14

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
Base Neutral cont SW846/8270A							
3776	anthracene	38,000.	17,000.	ug/kg	44,000.	20,000.	
3778	fluoranthene	63,000.	17,000.	ug/kg	74,000.	20,000.	
1195	pyrene	58,000.	17,000.	ug/kg	68,000.	20,000.	J
3781	benzo (a) anthracene	14,000.	17,000.	ug/kg	16,000.	20,000.	J
3782	chrysene	15,000.	17,000.	ug/kg	18,000.	20,000.	J
3786	benzo (b) fluoranthene	5,000.	330.	ug/kg	5,800.	380.	
3787	benzo (k) fluoranthene	2,100.	330.	ug/kg	2,400.	380.	
3788	benzo (a) pyrene	3,700.	330.	ug/kg	4,300.	380.	
3789	indeno (1,2,3-cd) pyrene	1,300.	330.	ug/kg	1,600.	380.	
3790	dibenz (a,h) anthracene	440.	330.	ug/kg	510.	380.	
3791	benzo (ghi) perylene	930.	330.	ug/kg	1,100.	380.	

PDC
 8/17/94

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jon S. Kauffman, Ph.D.
 Group Leader, GC/MS



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301





Lancaster Laboratories

Where quality is a science.

LLI Sample No. SW 2147674

Collected: 6/22/94 at 10:15 by DW

Submitted: 6/23/94 Reported: 8/ 5/94

Discard: 9/ 5/94

ON-2500E Composite Soil Sample
Moss American
(Solid Waste Area, 0.5-3.5', Odor)
2500E SDG#: MOS06-06

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

AS RECEIVED

DRY WEIGHT

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	1,200.	40.	mg/kg	1,500.	50.	
3297	Acenaphthylene	N.D.	40.	mg/kg	N.D.	50.	
3298	Acenaphthene	1,200.	40.	mg/kg	1,400.	50.	
3299	Fluorene	1,000.	40.	mg/kg	1,200.	50.	
3300	Phenanthrene	2,400.	10.	mg/kg	2,900.	10.	
3301	Anthracene	1,400.	10.	mg/kg	1,700.	10.	
3302	Fluoranthene	1,200.	4.	mg/kg	1,400.	5.	
3303	Pyrene	810.	4.	mg/kg	980.	5.	
3304	Benzo(a)anthracene	190.	0.2	mg/kg	230.	0.2	
3305	Chrysene	160.	2.	mg/kg	190.	2.	
3306	Benzo(b)fluoranthene	79.	0.4	mg/kg	96.	0.5	
3307	Benzo(k)fluoranthene	66.	0.4	mg/kg	56.	0.5	
3308	Benzo(a)pyrene	73.	0.4	mg/kg	88.	0.5	
3309	Dibenzo(a,h)anthracene	N.D.	30.	mg/kg	N.D.	40.	
3310	Benzo(g,h,i)perylene	84.	1.	mg/kg	100.	1.	
3311	Indeno(1,2,3-cd)pyrene	35.	1.	mg/kg	43.	1.	

Anthracene was marginally below the defined QC limit in the LCS.
Since the LOQ could still be seen after correction for the recovery was made, the data was reported.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2147672

Collected: 6/22/94 at 09:00 by DW

Submitted: 6/23/94 Reported: 8/ 5/94

Discard: 9/ 5/94

500M-900E Composite Soil Sample
Moss American

50900 SDG#: MOS06-04

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	2.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.	
3300	Phenanthrene	2.6	0.5	mg/kg	2.9	0.6	
3301	Anthracene	0.5	0.5	mg/kg	0.6	0.6	
3302	Fluoranthene	2.4	0.1	mg/kg	2.7	0.1	
3303	Pyrene	2.5	0.2	mg/kg	2.8	0.2	
3304	Benzo(a)anthracene	0.89	0.05	mg/kg	0.99	0.06	
3305	Chrysene	1.4	0.5	mg/kg	1.6	0.6	
3306	Benzo(b)fluoranthene	N.D.	2.	mg/kg	N.D.	2.	
3307	Benzo(k)fluoranthene	0.6	0.1	mg/kg	0.7	0.1	
3308	Benzo(a)pyrene	1.4	0.1	mg/kg	1.6	0.1	
3309	Dibenzo(a,h)anthracene	N.D.	0.1	mg/kg	N.D.	0.1	
3310	Benzo(g,h,i)perylene	N.D.	3.	mg/kg	N.D.	3.	
3311	Indeno(1,2,3-cd)pyrene	1.3	0.3	mg/kg	1.4	0.3	

Anthracene was marginally below the defined QC limit in the LCS.
Since the LOQ could still be seen after correction for the recovery was made, the data were reported.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2146943
 Collected: 6/21/94 at 10:45 by DW

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

Submitted: 6/22/94 Reported: 8/ 8/94
 Discard: 9/ 8/94

MA1-SSG31-1003-01 Composite Soil Sample
 Moss American
 600N-2700E
 31100 SDG#: MOS04-09

AS RECEIVED

DRY WEIGHT

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2. J	mg/kg	N.D.	2. J	mg/kg
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3300	Phenanthrene	0.015 J	0.5	mg/kg	0.019 J	0.6	mg/kg
3301	Anthracene	N.D.	0.5	mg/kg	N.D.	0.6	mg/kg
3302	Fluoranthene	0.021 J	0.2	mg/kg	0.025 J	0.2	mg/kg
3303	Pyrene	N.D.	0.2	mg/kg	N.D.	0.2	mg/kg
3304	Benzo(a)anthracene	N.D.	0.01	mg/kg	N.D. J	0.01	mg/kg
3305	Chrysene	N.D.	0.1	mg/kg	N.D. J	0.1	mg/kg
3306	Benzo(b)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02	mg/kg
3307	Benzo(k)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02	mg/kg
3308	Benzo(a)pyrene	N.D.	0.02	mg/kg	N.D.	0.02	mg/kg
3309	Dibenzo(a,h)anthracene	N.D.	0.02	mg/kg	N.D.	0.02	mg/kg
3310	Benzo(g,h,i)perylene	N.D.	0.05	mg/kg	N.D.	0.06	mg/kg
3311	Indeno(1,2,3-cd)pyrene	N.D.	0.05	mg/kg	N.D.	0.06	mg/kg

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were similar in both extracts.

WJC
8/23/94

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

See reverse side for explanation of symbols and abbreviations.





LLI Sample No. SW 2146941

Collected: 6/21/94 at 10:00 by DW

Submitted: 6/22/94 Reported: 8/ 8/94
Discard: 9/ 8/94

MA1-SSG32-1103-01 Composite Soil Sample
Moss American
600N-300E
32110 SDG#: MOS04-07

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.5	mg/kg	N.D.	2.5	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.	
3300	Phenanthrene	0.14 J	0.5	mg/kg	0.16 J	0.6	
3301	Anthracene	0.012 J	0.5	mg/kg	0.013 J	0.6	
3302	Fluoranthene	0.098 J	0.2	mg/kg	0.11 J	0.2	
3303	Pyrene	N.D.	0.2	mg/kg	N.D.	0.2	
3304	Benzo(a)anthracene	0.02	0.01	mg/kg	0.02 J	0.01	
3305	Chrysene	N.D.	0.1	mg/kg	N.D.	0.1	
3306	Benzo(b)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02	
3307	Benzo(k)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02	
3308	Benzo(a)pyrene	N.D.	0.02	mg/kg	N.D.	0.02	
3309	Dibenzo(a,h)anthracene	N.D.	0.02	mg/kg	N.D.	0.02	
3310	Benzo(g,h,i)perylene	N.D.	0.05	mg/kg	N.D.	0.06	
3311	Indeno(1,2,3-cd)pyrene	N.D.	0.05	mg/kg	N.D.	0.06	

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were similar in both extracts.

LTK 8/23/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations



LLI Sample No. SW 2146938

Collected: 6/21/94 at 09:05 by DW

Submitted: 6/22/94 Reported: 8/ 8/94
Discard: 9/ 8/94

MA1-SSG38-1105-01 Unspiked Composite Soil Sample
Moss American
1200V-300V
38110 SDG#: MOS04-06BK

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	2.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	
3299	Fluorene	0.82 J	2.	mg/kg	0.92 J	2.	
3300	Phenanthrene	3.4	0.5	mg/kg	3.8	0.6	
3301	Anthracene	0.30 J	0.5	mg/kg	0.34	0.6	
3302	Fluoranthene	1.8	0.2	mg/kg	2.0	0.2	
3303	Pyrene	1.2	0.2	mg/kg	1.4	0.2	
3304	Benzo(a)anthracene	0.30	0.01	mg/kg	0.33	0.01	
3305	Chrysene	0.2	0.1	mg/kg	0.3	0.1	
3306	Benzo(b)fluoranthene	0.10	0.02	mg/kg	0.11	0.02	
3307	Benzo(k)fluoranthene	0.06	0.02	mg/kg	0.07	0.02	
3308	Benzo(a)pyrene	0.09	0.02	mg/kg	0.10	0.02	
3309	Dibenzo(a,h)anthracene	0.05	0.02	mg/kg	0.06	0.02	
3310	Benzo(g,h,i)perylene	0.11	0.05	mg/kg	0.12	0.06	
3311	Indeno(1,2,3-cd)pyrene	N.D.	0.05	mg/kg	N.D.	0.06	

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were similar in both extracts.

WTC 8/29/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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* 221*



LLI Sample No. SW 2146936

Collected: 6/21/94 at 10:05 by DW

Submitted: 6/22/94 Reported: 8/ 8/94
Discard: 9/ 8/94

485N-552E-02 Composite Soil Sample
Moss American

48552 SDG#: MOS04-04

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.5	mg/kg	N.D.	2.5	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.	
3300	Phenanthrene	0.5	0.5	mg/kg	0.6	0.6	
3301	Anthracene	0.23	0.5	mg/kg	0.27	0.6	
3302	Fluoranthene	1.0	0.2	mg/kg	1.1	0.2	
3303	Pyrene	0.9	0.2	mg/kg	1.1	0.2	
3304	Benzo(a)anthracene	0.26	0.01	mg/kg	0.31	0.01	
3305	Chrysene	0.4	0.1	mg/kg	0.4	0.1	
3306	Benzo(b)fluoranthene	0.45	0.02	mg/kg	0.52	0.02	
3307	Benzo(k)fluoranthene	0.20	0.02	mg/kg	0.23	0.02	
3308	Benzo(a)pyrene	0.31	0.02	mg/kg	0.35	0.02	
3309	Dibenzo(a,h)anthracene	0.13	0.02	mg/kg	0.15	0.02	
3310	Benzo(g,h,i)perylene	0.85	0.05	mg/kg	0.98	0.06	
3311	Indeno(1,2,3-cd)pyrene	0.38	0.05	mg/kg	0.44	0.06	

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were similar in both extracts.

GTK 8/23/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2146935

Collected: 6/21/94 at 09:55 by DW

Submitted: 6/22/94 Reported: 8/ 8/94
Discard: 9/ 8/94

485N-552E-01 Composite Soil Sample
Moss American

48555 SDG#: MOS04-03

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

AS RECEIVED

DRY WEIGHT

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/B310)							
3296	Naphthalene	N.D.	2.5	mg/kg	N.D.	2.5	mg/kg
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3298	Acenaphthene	24.	2.	mg/kg	27.	2.	mg/kg
3299	Fluorene	13.	2.	mg/kg	14.	2.	mg/kg
3300	Phenanthrene	27.	0.5	mg/kg	31.	0.6	mg/kg
3301	Anthracene	5.1	0.5	mg/kg	5.8	0.6	mg/kg
3302	Fluoranthene	38.	0.2	mg/kg	43.	0.2	mg/kg
3303	Pyrene	28.	0.2	mg/kg	32.	0.2	mg/kg
3304	Benzo(a)anthracene	6.3	0.01	mg/kg	7.2	0.01	mg/kg
3305	Chrysene	5.9	0.1	mg/kg	6.8	0.1	mg/kg
3306	Benzo(b)fluoranthene	3.1	0.02	mg/kg	3.6	0.02	mg/kg
3307	Benzo(k)fluoranthene	1.8	0.02	mg/kg	2.0	0.02	mg/kg
3308	Benzo(a)pyrene	2.6	0.02	mg/kg	3.0	0.02	mg/kg
3309	Dibenzo(a,h)anthracene	1.1	0.02	mg/kg	1.3	0.02	mg/kg
3310	Benzo(g,h,i)perylene	2.8	0.05	mg/kg	3.2	0.06	mg/kg
3311	Indeno(1,2,3-cd)pyrene	1.5	0.05	mg/kg	1.7	0.06	mg/kg

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were similar in both extracts.

QC 8/23/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jennifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations





Lancaster Laboratories

Where quality is a science.

LLI Sample No. SW 2146934
 Collected: 6/21/94 at 09:00 by DW

Submitted: 6/22/94 Reported: 8/ 8/94
 Discard: 9/ 8/94

273N-524E Composite Soil Sample
 Moss American

27352 SDG#: MOS04-02

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	J mg/kg	N.D.	2.	J
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.	
3300	Phenanthrene	0.6	0.5	mg/kg	0.7	0.6	
3301	Anthracene	0.078 J	0.5	mg/kg	0.093 J	0.6	
3302	Fluoranthene	1.0	0.2	mg/kg	1.1	0.2	
3303	Pyrene	0.8	0.2	mg/kg	0.9	0.2	
3304	Benzo(a)anthracene	0.27	0.01	mg/kg	0.32	0.01	
3305	Chrysene	0.3	0.1	mg/kg	0.4	0.1	
3306	Benzo(b)fluoranthene	0.37	0.02	mg/kg	0.43	0.02	
3307	Benzo(k)fluoranthene	0.21	0.02	mg/kg	0.24	0.02	
3308	Benzo(a)pyrene	0.33	0.02	mg/kg	0.38	0.02	
3309	Dibenzo(a,h)anthracene	0.17	0.02	mg/kg	0.20	0.02	
3310	Benzo(g,h,i)perylene	1.1	0.05	mg/kg	1.3	0.06	
3311	Indeno(1,2,3-cd)pyrene	0.34	0.05	mg/kg	0.40	0.06	

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were higher in the original corresponding to higher surrogate recovery.

*GJK
8/23/94*

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2146933

Collected: 6/21/94 at 09:20 by DW

Submitted: 6/22/94 Reported: 8/ 8/94
Discard: 9/ 8/94

273N-473E Composite Soil Sample
Moss American

27347 SDG#: MOS04-01

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2. J	mg/kg	N.D.	2. J	mg/kg
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.	mg/kg
3300	Phenanthrene	0.42 J	0.5	mg/kg	0.49 J	0.6	mg/kg
3301	Anthracene	N.D.	0.5	mg/kg	N.D.	0.6	mg/kg
3302	Fluoranthene	0.6	0.2	mg/kg	0.8	0.2	mg/kg
3303	Pyrene	0.5	0.2	mg/kg	0.6	0.2	mg/kg
3304	Benzo(a)anthracene	0.17	0.01	mg/kg	0.20	0.01	mg/kg
3305	Chrysene	0.2	0.1	mg/kg	0.3	0.1	mg/kg
3306	Benzo(b)fluoranthene	0.24	0.02	mg/kg	0.28	0.02	mg/kg
3307	Benzo(k)fluoranthene	0.13	0.02	mg/kg	0.16	0.02	mg/kg
3308	Benzo(a)pyrene	0.21	0.02	mg/kg	0.25	0.02	mg/kg
3309	Dibenzo(a,h)anthracene	0.11	0.02	mg/kg	0.12	0.02	mg/kg
3310	Benzo(g,h,i)perylene	0.63	0.05	mg/kg	0.74	0.06	mg/kg
3311	Indeno(1,2,3-cd)pyrene	0.20	0.05	mg/kg	0.23	0.06	mg/kg

The spike data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Results were similar in both extracts.

WTK 8/23/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2147124

Collected: 6/20/94 at 16:40 by DW

Submitted: 6/22/94 Reported: 7/25/94

Discard: 8/25/94

MA1-SSG37-1004-01 Composite Soil Sample
Moss American
900N-3000E
37104 SDG#: MOS05-19

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	4.	2.	mg/kg	4.	2.
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.
3298	Acenaphthene	9.	2.	mg/kg	10.	2.
3299	Fluorene	6.	2.	mg/kg	7.	2.
3300	Phenanthrene	14.	0.5	mg/kg	17.	0.6
3301	Anthracene	1.8	0.5	mg/kg	2.1	0.6
3302	Fluoranthene	6.8	0.2	mg/kg	7.9	0.2
3303	Pyrene	4.6	0.2	mg/kg	5.3	0.2
3304	Benzo(a)anthracene	1.1	0.01	mg/kg	1.3	0.01
3305	Chrysene	1.4	0.1	mg/kg	1.6	0.1
3306	Benzo(b)fluoranthene	0.52	0.02	mg/kg	0.60	0.02
3307	Benzo(k)fluoranthene	0.38	0.02	mg/kg	0.44	0.02
3308	Benzo(a)pyrene	0.50 J	0.02	mg/kg	0.58 J	0.02
3309	Dibenzo(a,h)anthracene	0.25	0.02	mg/kg	0.30	0.02
3310	Benzo(g,h,i)perylene	0.49	0.05	mg/kg	0.57	0.06
3311	Indeno(1,2,3-cd)pyrene	0.31	0.05	mg/kg	0.36	0.06

The LCS results for Naphthalene are shown on the QC summary, however, they are not required for this method since the MS/MSD data is within the QC limits. Consequently, no action is needed for LCS results outside the QC limits.

AK
8/18/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2147121

Collected: 6/20/94 at 15:50 by DW

Submitted: 6/22/94 Reported: 7/25/94

Discard: 8/25/94

500N-1500E-01 Composite Soil Sample
Moss American

1500E SDG#: MOS05-16

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
Base Neutrals (SW846/8270A)						
3761	naphthalene	570,000.	50,000.	ug/kg	610,000.	54,000.
3765	acenaphthylene	3,700. J	10,000.	ug/kg	4,000. J	11,000.
1191	acenaphthene	380,000.	50,000.	ug/kg	410,000.	54,000.
3768	fluorene	310,000.	50,000.	ug/kg	340,000.	54,000.
3775	phenanthrene	730,000.	50,000.	ug/kg	780,000.	54,000.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jon S. Kauffman, Ph.D.
Group Leader, GC/MS



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



* 221E
9:13.9



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Where quality is a science.

LLI Sample No. SW 2147121

Collected: 6/20/94 at 15:50 by DW

Submitted: 6/22/94 Reported: 7/25/94

Discard: 8/25/94

500N-1500E-01 Composite Soil Sample
Moss American

1500E SDG#: MOS05-16

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
Base Neutral cont SW846/8270A							
3776	anthracene	69,000.	10,000.	ug/kg	74,000.	11,000.	
3778	fluoranthene	350,000.	50,000.	ug/kg	370,000.	54,000.	
1195	pyrene	250,000.	50,000.	ug/kg	270,000.	54,000.	
3781	benzo (a) anthracene	58,000.	10,000.	ug/kg	62,000.	11,000.	
3782	chrysene	52,000.	10,000.	ug/kg	56,000.	11,000.	
3786	benzo (b) fluoranthene	38,000.	10,000.	ug/kg	41,000.	11,000.	
3787	benzo (k) fluoranthene	N.D.	10,000.	ug/kg	N.D.	11,000.	
3788	benzo (a) pyrene	18,000.	10,000.	ug/kg	19,000.	11,000.	
3789	indeno (1,2,3-cd) pyrene	4,100. J	10,000.	ug/kg	4,400. J	11,000.	
3790	dibenz (a,h) anthracene	1,900. J	10,000.	ug/kg	2,000. J	11,000.	
3791	benzo (ghi) perylene	2,900. J	10,000.	ug/kg	3,100. J	11,000.	

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jon S. Kauffman, Ph.D.
Group Leader, GC/MS



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.





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LLI Sample No. SW 2147118

Collected: 6/20/94 at 13:30 by DW

Submitted: 6/22/94 Reported: 7/25/94

Discard: 8/25/94

300N-1350E-02 Composite Soil Sample
Moss American

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

30135 SDG#: MOS05-13

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	2.
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.
3300	Phenanthrene	0.15 J	0.5	mg/kg	0.16 J	0.6
3301	Anthracene	N.D.	0.5	mg/kg	N.D.	0.6
3302	Fluoranthene	0.2	0.2	mg/kg	0.2	0.2
3303	Pyrene	0.15 J	0.2	mg/kg	0.17 J	0.2
3304	Benzo(a)anthracene	0.04	0.01	mg/kg	0.05	0.01
3305	Chrysene	N.D.	0.1	mg/kg	N.D.	0.1
3306	Benzo(b)fluoranthene	0.017 J	0.02	mg/kg	0.019 J	0.02
3307	Benzo(k)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02
3308	Benzo(a)pyrene	N.D.	0.02	mg/kg	N.D.	0.02
3309	Dibenzo(a,h)anthracene	N.D.	0.02	mg/kg	N.D.	0.02
3310	Benzo(g,h,i)perylene	N.D.	0.05	mg/kg	N.D.	0.06
3311	Indeno(1,2,3-cd)pyrene	N.D.	0.05	mg/kg	N.D.	0.06

The LCS results for Naphthalene are shown on the QC summary, however, they are not required for this method since the MS/MSD data is within the QC limits. Consequently, no action is needed for LCS results outside the QC limits.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

60



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2147112

Collected: 6/20/94 at 13:35 by DW

Submitted: 6/22/94 Reported: 7/25/94

Discard: 8/25/94

MA1-SSG30-0903M-01 Unspiked Composite Soil Sample

Moss American

600N-2400E

30903 SDG#: MOS05-09BK

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	2.
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	2.
3299	Fluorene	N.D.	2.	mg/kg	N.D.	2.
3300	Phenanthrene	0.016 J	0.5	mg/kg	0.018 J	0.6
3301	Anthracene	N.D.	0.5	mg/kg	N.D.	0.6
3302	Fluoranthene	N.D.	0.2	mg/kg	N.D.	0.2
3303	Pyrene	N.D.	0.2	mg/kg	N.D.	0.2
3304	Benzo(a)anthracene	N.D.	0.01	mg/kg	N.D.	0.01
3305	Chrysene	N.D.	0.1	mg/kg	N.D.	0.1
3306	Benzo(b)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02
3307	Benzo(k)fluoranthene	N.D.	0.02	mg/kg	N.D.	0.02
3308	Benzo(a)pyrene	N.D.	0.02	mg/kg	N.D.	0.02
3309	Dibenzo(a,h)anthracene	N.D.	0.03	mg/kg	N.D.	0.03
3310	Benzo(g,h,i)perylene	N.D.	0.05	mg/kg	N.D.	0.06
3311	Indeno(1,2,3-cd)pyrene	N.D.	0.05	mg/kg	N.D.	0.06

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The LCS results for Naphthalene are shown on the QC summary, however, they are not required for this method since the MS/MSD data is within the QC limits. Consequently, no action is needed for LCS results outside the QC limits.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

See reverse side for explanation of symbols and abbreviations.



16
5



LLI Sample No. SW 2147104

Collected: 6/20/94 at 09:00 by DW

Submitted: 6/22/94 Reported: 7/25/94

Discard: 8/25/94

665N-1490E-01 Composite Soil Sample
Moss American

66514 SDG#: MOS05-01

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	900.	200.	mg/kg	1,000.	200.
3297	Acenaphthylene	N.D.	200.	mg/kg	N.D.	200.
3298	Acenaphthene	400.	200.	mg/kg	500.	200.
3299	Fluorene	400.	200.	mg/kg	400.	200.
3300	Phenanthrene	740.	50.	mg/kg	800.	50.
3301	Anthracene	80.	50.	mg/kg	90.	50.
3302	Fluoranthene	310.	20.	mg/kg	330.	20.
3303	Pyrene	250.	20.	mg/kg	270.	20.
3304	Benzo(a)anthracene	57.	1.	mg/kg	61.	1.
3305	Chrysene	60.	10.	mg/kg	60.	10.
3306	Benzo(b)fluoranthene	18.	2.	mg/kg	19.	2.
3307	Benzo(k)fluoranthene	10.	2.	mg/kg	11.	2.
3308	Benzo(a)pyrene	18.	2.	mg/kg	19.	2.
3309	Dibenzo(a,h)anthracene	N.D.	6.	mg/kg	N.D.	6.
3310	Benzo(g,h,i)perylene	N.D.	20.	mg/kg	N.D.	20.
3311	Indeno(1,2,3-cd)pyrene	20.	5.	mg/kg	21.	5.

The LCS results for Naphthalene are shown on the QC summary, however, they are not required for this method since the MS/MSD data is within the QC limits. Consequently, no action is needed for LCS results outside the QC limits.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

32

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2145488

Collected: 6/17/94 at 11:45 by TS

Submitted: 6/20/94 Reported: 7/14/94

Discard: 8/14/94

300N-1050E Composite Soil Sample
Moss American

30010 SDG#: MOS03-12

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	29.	2.	mg/kg	36.	2.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	N.D.	10.	mg/kg	N.D.	10.	
3299	Fluorene	18.	2.	mg/kg	22.	2.	
3300	Phenanthrene	35.	0.5	mg/kg	43.	0.6	
3301	Anthracene	N.D.	10.	mg/kg	N.D.	10.	
3302	Fluoranthene	16. J	0.2	mg/kg	20. J	0.2	
3303	Pyrene	11.	0.2	mg/kg	13.	0.2	
3304	Benzo(a)anthracene	2.8	0.01	mg/kg	3.5	0.01	
3305	Chrysene	1.5	0.1	mg/kg	1.9	0.1	
3306	Benzo(b)fluoranthene	0.98	0.02	mg/kg	1.2	0.02	
3307	Benzo(k)fluoranthene	0.59	0.02	mg/kg	0.73	0.02	
3308	Benzo(a)pyrene	0.95 J	0.02	mg/kg	1.2 J	0.02	
3309	Dibenzo(a,h)anthracene	N.D. J	0.5	mg/kg	N.D. J	0.6	
3310	Benzo(g,h,i)perylene	N.D.	1.	mg/kg	N.D.	1.	
3311	Indeno(1,2,3-cd)pyrene	N.D.	1.	mg/kg	N.D.	1.	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

*PC
8/16/94*

*WPC
8/16/94*

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

60



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.





LLI Sample No. SW 2145487
Collected: 6/17/94 at 09:20 by TS

Submitted: 6/20/94 Reported: 7/14/94
Discard: 8/14/94

380N-1270E-01 Composite Soil Sample
Moss American

38127 SDG#: MOS03-11

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

AS RECEIVED

DRY WEIGHT

LIMIT OF
QUANTITATION

LIMIT OF
QUANTITATION

CAT NO.	ANALYSIS NAME	RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	3.
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	3.
3299	Fluorene	N.D.	2.	mg/kg	N.D.	3.
3300	Phenanthrene	0.43 J	0.5	mg/kg	0.60 J	0.7
3301	Anthracene	0.27 J	0.5	mg/kg	0.38 J	0.7
3302	Fluoranthene	0.7 J	0.2	mg/kg	1.0 J	0.3
3303	Pyrene	0.5	0.2	mg/kg	0.8 J	0.3
3304	Benzo(a)anthracene	0.15	0.01	mg/kg	0.20	0.01
3305	Chrysene	0.1 J	0.1	mg/kg	0.2 J	0.1
3306	Benzo(b)fluoranthene	0.14	0.02	mg/kg	0.19	0.03
3307	Benzo(k)fluoranthene	N.D.	0.04	mg/kg	N.D.	0.06
3308	Benzo(a)pyrene	0.11 J	0.02	mg/kg	0.16 J	0.03
3309	Dibenzo(a,h)anthracene	N.D. J	0.06	mg/kg	N.D. J	0.08
3310	Benzo(g,h,i)perylene	0.36	0.05	mg/kg	0.50	0.07
3311	Indeno(1,2,3-cd)pyrene	0.13	0.05	mg/kg	0.18	0.07

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

PC
8/16/14

8/16/94
WTR

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jennifer E. Hess, B.S.
Group Leader Pesticides/PCBs

58



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2145477
 Collected: 6/17/94 at 11:10 by TS

Submitted: 6/20/94 Reported: 7/14/94
 Discard: 8/14/94

ON-2550E-01 Unspiked Composite Soil Sample
 Moss American

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

2550E SDG#: MOS03-03BK

AS RECEIVED

DRY WEIGHT

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
Base Neutrals (SWB46/B270A)							
3761	naphthalene	280,000.	100,000.	ug/kg	410,000.	140,000.	
3765	acenaphthylene	27,000.	100,000.	ug/kg	38,000.	140,000.	J
1191	acenaphthene	2,500,000.	200,000.	ug/kg	3,600,000.	290,000.	J
3768	fluorene	1,200,000.	100,000.	ug/kg	1,700,000.	140,000.	J
3775	phenanthrene	2,900,000.	200,000.	ug/kg	4,200,000.	290,000.	J

POC
8/16/94

GC
8/14/94

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jon S. Kauffman, Ph.D.
 Group Leader, GC/MS



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2145477

Collected: 6/17/94 at 11:10 by TS

Submitted: 6/20/94 Reported: 7/14/94

Discard: 8/14/94

ON-2550E-01 Unspiked Composite Soil Sample
Moss American

2550E SDG#: MOS03-03BK

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
Base Neutral cont SW846/8270A							
3776	anthracene	880,000.	100,000.	ug/kg	1,300,000.	140,000.	
3778	fluoranthene	2,700,000.	200,000.	ug/kg	3,900,000.	290,000.	
1195	pyrene	2,100,000.	200,000.	ug/kg	3,000,000.	290,000.	
3781	benzo (a) anthracene	520,000.	100,000.	ug/kg	750,000.	140,000.	
3782	chrysene	520,000.	100,000.	ug/kg	750,000.	140,000.	
3786	benzo (b) fluoranthene	510,000.	100,000.	ug/kg	740,000.	140,000.	
3787	benzo (k) fluoranthene	N.D.	100,000.	ug/kg	N.D.	140,000.	
3788	benzo (a) pyrene	210,000.	100,000.	ug/kg	300,000.	140,000.	
3789	indeno (1,2,3-cd) pyrene	56,000.	100,000.	ug/kg	81,000.	140,000.	
3790	dibenz (a,h) anthracene	15,000.	100,000.	ug/kg	22,000.	140,000.	
3791	benzo (ghi) perylene	45,000.	100,000.	ug/kg	65,000.	140,000.	

Poc
8/16/94

WTC
8/14/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jon S. Kauffman, Ph.D.
Group Leader, GC/MS



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2148330

Collected: 6/23/94 at 08:50 by DW

Submitted: 6/24/94 Reported: 8/15/94

Discard: 9/15/94

75N-900E-01 Composite Soil Sample
Moss American
(Odor, 3-13')
75901 SDG#: MOS07-07

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	18. J	2.	mg/kg	21. J	2.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	2.	
3298	Acenaphthene	10. J	2.	mg/kg	12. J	2.	
3299	Fluorene	12. J	2.	mg/kg	14. J	2.	
3300	Phenanthrene	37. ↓	0.5	mg/kg	43. ↓	0.6	
3301	Anthracene	8.3	0.5	mg/kg	9.6	0.6	
3302	Fluoranthene	19.	0.2	mg/kg	22.	0.2	
3303	Pyrene	13.	0.2	mg/kg	15.	0.2	
3304	Benzo(a)anthracene	4.1	0.01	mg/kg	4.8	0.01	
3305	Chrysene	4.8	0.1	mg/kg	5.6	0.1	
3306	Benzo(b)fluoranthene	N.D.	2.	mg/kg	N.D.	2.	
3307	Benzo(k)fluoranthene	0.86	0.02	mg/kg	1.0	0.02	
3308	Benzo(a)pyrene	1.5	0.02	mg/kg	1.7	0.02	
3309	Dibenzo(a,h)anthracene	0.51	0.02	mg/kg	0.59	0.02	
3310	Benzo(g,h,i)perylene	N.D.	2.	mg/kg	N.D.	2.	
3311	Indeno(1,2,3-cd)pyrene	N.D.	0.2	mg/kg	N.D.	0.2	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The QC data is outside the required limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. Similar results were obtained in both extractions.

POC
8/24/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2148321
 Collected: 6/22/94 at 14:40 by DW

Submitted: 6/24/94 Reported: 8/15/94
 Discard: 9/15/94

75S-600E-01 Composite Soil Sample
 Moss American

75600 SDG#: MOS07-01

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	20.	J mg/kg	N.D.	20.	J
3297	Acenaphthylene	N.D.	20.	mg/kg	N.D.	20.	
3298	Acenaphthene	N.D.	20.	J mg/kg	N.D.	20.	J
3299	Fluorene	N.D.	20.	J mg/kg	N.D.	20.	J
3300	Phenanthrene	1.5 J	5.	mg/kg	1.8 J	6.	
3301	Anthracene	1.3 J	5.	mg/kg	1.6 J	6.	
3302	Fluoranthene	4.	2.	mg/kg	5.	2.	
3303	Pyrene	4.	2.	mg/kg	5.	2.	
3304	Benzo(a)anthracene	1.1	0.1	mg/kg	1.4	0.1	
3305	Chrysene	2.	1.	mg/kg	2.	1.	
3306	Benzo(b)fluoranthene	N.D.	3.	mg/kg	N.D.	4.	
3307	Benzo(k)fluoranthene	0.8	0.2	mg/kg	1.0	0.2	
3308	Benzo(a)pyrene	1.5	0.2	mg/kg	1.9	0.2	
3309	Dibenzo(a,h)anthracene	0.5	0.2	mg/kg	0.6	0.2	
3310	Benzo(g,h,i)perylene	4.4	0.5	mg/kg	5.5	0.6	
3311	Indeno(1,2,3-cd)pyrene	1.5	0.5	mg/kg	1.9	0.6	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The LCS data is outside the QC limits. Results from the reprep are within the limits. The hold time had expired prior to the reprep so it can only qualify the original data. The results were higher in the second extraction which is in accordance with the increase in surrogate recovery.

PDC
 8/24/94

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

See reverse side for explanation of symbols and abbreviations.





LLI Sample No. SW 2158218
 Collected: 7/18/94 at 16:50 by D

Submitted: 7/19/94 Reported: 8/26/94
 Discard: 9/26/94

MA1-SD03-0021-01 Composite Sediment Sample
 Moss - American Superfund Site - Milwaukee, WI

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City, OK 73125-0861

P.O. MOSS - AMERICAN
 Rel.

SD321 SDG#: MOS14-17

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	METHOD	DETECTION LIMIT UNITS	RESULTS	METHOD	DETECTION LIMIT
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	0.2	mg/kg	N.D.	0.3	
3297	Acenaphthylene	N.D.	0.2	mg/kg	N.D.	0.3	
3298	Acenaphthene	7.	0.2	mg/kg	9.	0.3	
3299	Fluorene	5.	0.05	mg/kg	6.	0.06	
3300	Phenanthrene	9.2	0.006	mg/kg	12.	0.008	
3301	Anthracene	1.7	0.005	mg/kg	2.2	0.006	
3302	Fluoranthene	15.	0.005	mg/kg	19.	0.006	
3303	Pyrene	9.7	0.08	mg/kg	12.	0.1	
3304	Benzo(a)anthracene	2.8	0.004	mg/kg	3.4	0.005	
3305	Chrysene	3.2	0.04	mg/kg	3.9	0.05	
3306	Benzo(b)fluoranthene	N.D.	0.6	mg/kg	N.D.	0.8	
3307	Benzo(k)fluoranthene	0.89	0.002	mg/kg	1.1	0.003	
3308	Benzo(a)pyrene	1.9	0.005	mg/kg	2.4	0.006	
3309	Dibenzo(a,h)anthracene	0.82	0.01	mg/kg	1.0	0.01	
3310	Benzo(g,h,i)perylene	2.2	0.03	mg/kg	2.7	0.04	
3311	Indeno(1,2,3-cd)pyrene	0.99	0.04	mg/kg	1.2	0.05	

Due to interfering peaks on the chromatogram, the value reported for Benzo(b)fluoranthene represents the lowest quantitation limit obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301





LLI Sample No. SW 2158205
 Collected: 7/15/94 at 15:45 by D

Submitted: 7/19/94 Reported: 8/26/94
 Discard: 9/26/94

MA1-SD03-0008-01 Composite Sediment Sample
 Moss - American Superfund Site - Milwaukee, WI

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City, OK 73125-0861

P.O. MOSS - AMERICAN
 Rel.

SD308 SDG#: MOS14-04

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	METHOD	DETECTION LIMIT UNITS	RESULTS	METHOD	DETECTION LIMIT
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.		0.2 mg/kg	N.D.		0.3
3297	Acenaphthylene	N.D.		0.2 mg/kg	N.D.		0.3
3298	Acenaphthene	3.		0.2 mg/kg	5.		0.3
3299	Fluorene	3.		0.05 mg/kg	4.		0.08
3300	Phenanthrene	6.5		0.006 mg/kg	11.		0.010
3301	Anthracene	1.9		0.005 mg/kg	3.1		0.008
3302	Fluoranthene	6.5		0.005 mg/kg	11.		0.008
3303	Pyrene	5.1		0.08 mg/kg	8.3		0.1
3304	Benzo(a)anthracene	1.7		0.004 mg/kg	2.7		0.007
3305	Chrysene	1.8		0.04 mg/kg	2.9		0.07
3306	Benzo(b)fluoranthene	N.D.		0.4 mg/kg	N.D.		0.7
3307	Benzo(k)fluoranthene	0.51		0.002 mg/kg	0.86		0.003
3308	Benzo(a)pyrene	0.95		0.005 mg/kg	1.5		0.008
3309	Dibenzo(a,h)anthracene	0.39		0.01 mg/kg	0.64		0.02
3310	Benzo(g,h,i)perylene	1.1		0.03 mg/kg	1.7		0.05
3311	Indeno(1,2,3-cd)pyrene	0.42		0.04 mg/kg	0.69		0.07

Due to interfering peaks on the chromatogram, the value reported for Benzo(b)fluoranthene represents the lowest quantitation limit obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

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LLI Sample No. SW 2157655

Collected: 7/15/94 at 14:30 by RS

Submitted: 7/16/94 Reported: 8/18/94

Discard: 9/18/94

MA1-SD03-0005-01 Composite Sediment Sample
Moss - American Superfund Site - Milwaukee, WI

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City, OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

SD305 SDG#: MOS13-12*

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	N.D.	20.	mg/kg	N.D.	30.
3297	Acenaphthylene	N.D.	20.	mg/kg	N.D.	30.
3298	Acenaphthene	40.	20.	mg/kg	70.	30.
3299	Fluorene	30.	20.	mg/kg	50.	30.
3300	Phenanthrene	100.	5.	mg/kg	160.	8.
3301	Anthracene	9.	5.	mg/kg	15.	8.
3302	Fluoranthene	51.	2.	mg/kg	82.	3.
3303	Pyrene	24.	2.	mg/kg	30.	3.
3304	Benzo(a)anthracene	6.2	0.1	mg/kg	10.	0.2
3305	Chrysene	6.	1.	mg/kg	9.	2.
3306	Benzo(b)fluoranthene	N.D.	3.	mg/kg	N.D.	5.
3307	Benzo(k)fluoranthene	1.3	0.2	mg/kg	2.2	0.3
3308	Benzo(a)pyrene	2.1	0.2	mg/kg	3.4	0.3
3309	Dibenzo(a,h)anthracene	0.8	0.2	mg/kg	1.2	0.3
3310	Benzo(g,h,i)perylene	1.7	0.5	mg/kg	2.7	0.8
3311	Indeno(1,2,3-cd)pyrene	0.8	0.5	mg/kg	1.3	0.8

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
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Lancaster, PA 17601-5994
717-656-2301



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LLI Sample No. SW 2159602
Collected: 7/20/94 at 10:05

Submitted: 7/21/94 Reported: 9/13/94
Discard: 9/24/94

MA1-SD02-0017-01 Composite Sediment Sample
Moss-American Site

-0017 SDG#: MOS15-06

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.		3.
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.		3.
3298	Acenaphthene	25.	2.	mg/kg	35.		3.
3299	Fluorene	26.	2.	mg/kg	36.		3.
3300	Phenanthrene	65.	0.5	mg/kg	90.		0.7
3301	Anthracene	12.	0.5	mg/kg	17.	J	0.7
3302	Fluoranthene	50.	0.2	mg/kg	69.		0.3
3303	Pyrene	33.	0.2	mg/kg	45.		0.3
3304	Benzo(a)anthracene	10.	0.01	mg/kg	14.	J	0.01
3305	Chrysene	8.8	0.1	mg/kg	12.		0.1
3306	Benzo(b)fluoranthene	5.8	0.02	mg/kg	8.1		0.03
3307	Benzo(k)fluoranthene	3.4	0.02	mg/kg	4.7		0.03
3308	Benzo(a)pyrene	6.4	0.02	mg/kg	8.9		0.03
3309	Dibenzo(a,h)anthracene	N.D.	2.	mg/kg	N.D.		3.
3310	Benzo(g,h,i)perylene	4.3	0.05	mg/kg	6.0		0.07
3311	Indeno(1,2,3-cd)pyrene	1.9	0.05	mg/kg	2.7		0.07

The surrogate data in the blank, and Anthracene and Benzo(a)anthracene are outside the defined Quality Control Limits. Results for the blank and Benzo(a)anthracene in the reprep are within the Limits, however Anthracene is outside the Limits due to suspected interference with closely eluting Decafluorobiphenyl. Hold time had expired prior to the reprep so it can only qualify the original data. Similar results were obtained in the reprep.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

PC
9/29/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2159600
 Collected: 7/20/94 at 09:30

Submitted: 7/21/94 Reported: 9/13/94
 Discard: 9/24/94

MA1-SD02-0015-01 Composite Sediment Sample
 Moss-American Site

-0015 SDG#: MOS15-04

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	UNITS
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	8.	mg/kg	N.D.	10.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.	
3298	Acenaphthene	7.	2.	mg/kg	10.	3.	
3299	Fluorene	5.	2.	mg/kg	7.	3.	
3300	Phenanthrene	5.9	0.5	mg/kg	8.4	0.7	
3301	Anthracene	2.3	0.5	mg/kg	3.3	0.7	J
3302	Fluoranthene	10.	0.2	mg/kg	14.	0.3	
3303	Pyrene	7.5	0.2	mg/kg	11.	0.3	
3304	Benzo(a)anthracene	2.4	0.01	mg/kg	3.5	0.01	J
3305	Chrysene	2.4	0.1	mg/kg	3.5	0.1	
3306	Benzo(b)fluoranthene	N.D.	3.	mg/kg	N.D.	4.	
3307	Benzo(k)fluoranthene	1.0	0.02	mg/kg	1.4	0.03	
3308	Benzo(a)pyrene	2.2	0.02	mg/kg	3.1	0.03	
3309	Dibenzo(a,h)anthracene	1.2	0.02	mg/kg	1.7	0.03	
3310	Benzo(g,h,i)perylene	2.2	0.05	mg/kg	3.1	0.07	
3311	Indeno(1,2,3-cd)pyrene	1.1	0.05	mg/kg	1.6	0.07	

The surrogate data in the blank, and Anthracene and Benzo(a)anthracene are outside the defined Quality Control Limits. Results for the blank and Benzo(a)anthracene in the reprep are within the Limits, however Anthracene is outside the Limits due to suspected interference with closely eluting Decafluorobiphenyl. Hold time had expired prior to the reprep so it can only qualify the original data. Similar results were obtained in the reprep.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

PDC
 9/29/94

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

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LLI Sample No. SW 2159595

Collected: 7/19/94 at 16:15

Submitted: 7/21/94 Reported: 9/ 3/94

Discard: 9/14/94

MA1-SD02-0010-01 Composite Sediment Sample

Moss-American Site
10--- SDG#: MOS16-11

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	3.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.	
3298	Acenaphthene	12.	2.	mg/kg	19.	3.	
3299	Fluorene	10.	2.	mg/kg	15.	3.	
3300	Phenanthrene	24.	0.5	mg/kg	36.	0.8	
3301	Anthracene	2.6	0.5	mg/kg	4.0	0.8	
3302	Fluoranthene	13.	0.2	mg/kg	20.	0.3	
3303	Pyrene	7.7	0.2	mg/kg	12.	0.3	
3304	Benzo(a)anthracene	2.6	0.01	mg/kg	4.0	0.02	
3305	Chrysene	3.1	0.1	mg/kg	4.7	0.2	
3306	Benzo(b)fluoranthene	N.D.	3.	mg/kg	N.D.	5.	
3307	Benzo(k)fluoranthene	1.2	0.02	mg/kg	1.9	0.03	
3308	Benzo(a)pyrene	2.6	0.02	mg/kg	4.1	0.03	
3309	Dibenzo(a,h)anthracene	1.2	0.02	mg/kg	1.9	0.03	
3310	Benzo(g,h,i)perylene	4.3	0.05	mg/kg	6.6	0.08	
3311	Indeno(1,2,3-cd)pyrene	1.9	0.05	mg/kg	2.9	0.08	

Due to interfering peaks on the chromatogram, the value reported for Benzo(b)fluoranthene represents the lowest quantitation limit obtainable.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Respectfully Submitted
Jennifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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LLI Sample No. SW 2159594
 Collected: 7/19/94 at 15:20

Submitted: 7/21/94 Reported: 9/ 3/94
 Discard: 9/14/94

MA1-SD02-0009-01 Composite Sediment Sample

Moss-American Site
 09--- SDG#: MOS16-10

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/B310)							
3296	Naphthalene	N.D.	30.	mg/kg	N.D.	40.	
3297	Acenaphthylene	N.D.	5.	mg/kg	N.D.	7.	
3298	Acenaphthene	140.	2.	mg/kg	210.	3.	J ↓
3299	Fluorene	100.	2.	mg/kg	150.	3.	
3300	Phenanthrene	190.	0.5	mg/kg	280.	0.7	
3301	Anthracene	48.	0.5	mg/kg	70.	0.7	
3302	Fluoranthene	140.	0.2	mg/kg	200.	0.3	
3303	Pyrene	93.	0.2	mg/kg	140.	0.3	
3304	Benzo(a)anthracene	24.	0.01	mg/kg	35.	0.01	
3305	Chrysene	25.	0.1	mg/kg	36.	0.1	
3306	Benzo(b)fluoranthene	12.	0.02	mg/kg	17.	0.03	
3307	Benzo(k)fluoranthene	6.4	0.02	mg/kg	9.4	0.03	
3308	Benzo(a)pyrene	13.	0.02	mg/kg	19.	0.03	
3309	Dibenzo(a,h)anthracene	N.D.	30.	mg/kg	N.D.	40.	
3310	Benzo(g,h,i)perylene	N.D.	5.	mg/kg	N.D.	7.	
3311	Indeno(1,2,3-cd)pyrene	N.D.	40.	mg/kg	N.D.	60.	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

ADZ
 7/29/94

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

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LLI Sample No. SW 2159592
 Collected: 7/19/94 at 14:35

Submitted: 7/21/94 Reported: 9/ 3/94
 Discard: 9/14/94

MA1-SD02-0007-01 Composite Sediment Sample
 Moss-American Site

07--- SDG#: MOS16-08

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	5.	mg/kg	N.D.	8.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.	
3298	Acenaphthene	46.	2.	mg/kg	71.	3.	
3299	Fluorene	61.	2.	mg/kg	95.	3.	
3300	Phenanthrene	120.	0.5	mg/kg	180.	0.8	
3301	Anthracene	18.	0.5	mg/kg	28.	0.8	
3302	Fluoranthene	84.	0.2	mg/kg	130.	0.3	
3303	Pyrene	46.	0.2	mg/kg	72.	0.3	
3304	Benzo(a)anthracene	14.	0.01	mg/kg	21.	0.02	
3305	Chrysene	13.	0.1	mg/kg	20.	0.2	
3306	Benzo(b)fluoranthene	N.D.	7.	mg/kg	N.D.	10.	
3307	Benzo(k)fluoranthene	3.4	0.02	mg/kg	5.3	0.03	
3308	Benzo(a)pyrene	6.0	0.02	mg/kg	9.3	0.03	
3309	Dibenzo(a,h)anthracene	1.5	0.02	mg/kg	2.4	0.03	
3310	Benzo(g,h,i)perylene	4.0	0.05	mg/kg	6.1	0.08	
3311	Indeno(1,2,3-cd)pyrene	1.8	0.05	mg/kg	2.8	0.08	

Due to interfering peaks on the chromatogram, the values reported for Benzo(b)fluoranthene and Naphthalene represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2159586

Collected: 7/19/94 at 11:00

Submitted: 7/21/94 Reported: 9/ 3/94

Discard: 9/14/94

MA1-SD02-0004-01 Composite Sediment Sample
Moss-American Site

04--- SDG#: MOS16-04

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	30.	mg/kg	N.D.	50.	
3297	Acenaphthylene	N.D.	5.	mg/kg	N.D.	8.	
3298	Acenaphthene	160.	2.	mg/kg	250.	3.	
3299	Fluorene	120.	2.	mg/kg	190.	3.	
3300	Phenanthrene	320.	0.5	mg/kg	500.	0.8	
3301	Anthracene	35.	0.5	mg/kg	55.	0.8	
3302	Fluoranthene	170.	0.2	mg/kg	270.	0.3	
3303	Pyrene	120.	0.2	mg/kg	190.	0.3	
3304	Benzo(a)anthracene	28.	0.01	mg/kg	43.	0.02	
3305	Chrysene	33.	0.1	mg/kg	52.	0.2	
3306	Benzo(b)fluoranthene	11.	0.02	mg/kg	17.	0.03	
3307	Benzo(k)fluoranthene	6.1	0.02	mg/kg	9.5	0.03	
3308	Benzo(a)pyrene	12.	0.02	mg/kg	19.	0.03	
3309	Dibenzo(a,h)anthracene	3.5	0.02	mg/kg	5.5	0.03	
3310	Benzo(g,h,i)perylene	8.6	0.05	mg/kg	13.	0.08	
3311	Indeno(1,2,3-cd)pyrene	3.9	0.05	mg/kg	6.1	0.08	

Due to interfering peaks on the chromatogram, the values reported for Naphthalene and Acenaphthylene represent the lowest quantitation limits obtainable.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.



LLI Sample No. SW 2159584
 Collected: 7/19/94 at 09:25

Submitted: 7/21/94 Reported: 9/ 3/94
 Discard: 9/14/94

MA1-SD02-0002-01 Composite Sediment Sample
 Moss-American Site

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

02--- SDG#: MOS16-02

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	3.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.	
3298	Acenaphthene	21.	2.	mg/kg	28.	3.	
3299	Fluorene	18.	2.	mg/kg	25.	3.	
3300	Phenanthrene	43.	0.5	mg/kg	60.	0.7	
3301	Anthracene	8.1	0.5	mg/kg	11.	0.7	
3302	Fluoranthene	31.	0.2	mg/kg	43.	0.3	
3303	Pyrene	25.	0.2	mg/kg	34.	0.3	
3304	Benzo(a)anthracene	5.9	0.01	mg/kg	8.1	0.01	
3305	Chrysene	7.3	0.1	mg/kg	10.	0.1	
3306	Benzo(b)fluoranthene	N.D.	4.	mg/kg	N.D.	6.	
3307	Benzo(k)fluoranthene	2.0	0.02	mg/kg	2.7	0.03	
3308	Benzo(a)pyrene	4.5	0.02	mg/kg	6.3	0.03	
3309	Dibenzo(a,h)anthracene	1.5	0.02	mg/kg	2.1	0.03	
3310	Benzo(g,h,i)perylene	3.8	0.05	mg/kg	5.3	0.07	
3311	Indeno(1,2,3-cd)pyrene	1.8	0.05	mg/kg	2.4	0.07	

Due to interfering peaks on the chromatogram, the value reported for Benzo(b)fluoranthene represents the lowest quantitation limit obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
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 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
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 Lancaster, PA 17601-5994
 717-656-2301

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* 2216
 9/13/90



LLI Sample No. SW 2163177

Collected: 7/27/94 at 09:50

Submitted: 7/28/94 Reported: 9/28/94

Discard: 10/29/94

MA1-SD01-0020-01 Composite Sediment Sample
Moss-American Superfund Site - Milwaukee, WI

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

20SD- SDG#: MOS18-03

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	4.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	4.	
3298	Acenaphthene	8.	2.	mg/kg	15.	4.	J
3299	Fluorene	N.D.	200.	mg/kg	N.D.	400.	
3300	Phenanthrene	33.8 J	50.	mg/kg	63.	90.	J
3301	Anthracene	11.6 J	50.	mg/kg	21.6 J	90.	J
3302	Fluoranthene	40.	20.	mg/kg	70.	40.	J
3303	Pyrene	20.	20.	mg/kg	50.	40.	J
3304	Benzo(a)anthracene	9.	1.	mg/kg	17.	2.	J
3305	Chrysene	10. J	10.	mg/kg	18.	20.	J
3306	Benzo(b)fluoranthene	N.D.	6.	mg/kg	N.D.	10.	
3307	Benzo(k)fluoranthene	3.	2.	mg/kg	6.	4.	J
3308	Benzo(a)pyrene	6.	2.	mg/kg	11.	4.	J
3309	Dibenzo(a,h)anthracene	N.D.	2.	mg/kg	N.D.	4.	
3310	Benzo(g,h,i)perylene	3.86	0.05	mg/kg	7.19 J	0.09	J
3311	Indeno(1,2,3-cd)pyrene	2.99	0.05	mg/kg	5.57 J	0.09	J

Benzo(a)anthracene was quantitated in the extraction blank. Benzo(a)anthracene was detected in the sample at greater than five times the level in the blank. Therefore, the data was reported. The recovery for Fluoranthene was 3% above the defined quality control limits, and the data was accepted. Due to the high concentrations of target analytes, the sample extracts had to be diluted. The diluted extracts were analyzed outside of the holding time. The data was accepted because the diluted values from outside the holding time agreed with the undiluted values from within the holding time.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

ADC
10/14/94

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2163176
Collected: 7/27/94 at 09:30

Submitted: 7/28/94 Reported: 9/28/94
Discard: 10/29/94

MA1-SD01-0019-01 Composite Sediment Sample
Moss-American Superfund Site - Milwaukee, WI

19SD- SDG#: MOS18-02

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION
PAH's in Solids (SW846/8310)						
3296	Naphthalene	N.D.	6.	mg/kg	N.D.	10.
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	4.
3298	Acenaphthene	27.	2.	mg/kg	51.	4.
3299	Fluorene	17. J	40.	mg/kg	32. J	80.
3300	Phenanthrene	50.	10.	mg/kg	90.	20.
3301	Anthracene	9.2 J	10.	mg/kg	17.3 J	20.
3302	Fluoranthene	60.	40.	mg/kg	120.	80.
3303	Pyrene	20.	4.	mg/kg	37.	8.
3304	Benzo(a)anthracene	7.1	0.2	mg/kg	13.3	0.4
3305	Chrysene	7.	2.	mg/kg	13.	4.
3306	Benzo(b)fluoranthene	3.7	0.4	mg/kg	6.8	0.8
3307	Benzo(k)fluoranthene	2.2	0.4	mg/kg	4.2	0.8
3308	Benzo(a)pyrene	3.5	0.4	mg/kg	6.6	0.8
3309	Dibenzo(a,h)anthracene	N.D.	2.	mg/kg	N.D.	4.
3310	Benzo(g,h,i)perylene	4.59	0.05	mg/kg	8.61	0.09
3311	Indeno(1,2,3-cd)pyrene	2.	1.	mg/kg	4.	2.

Benzo(a)anthracene was quantitated in the extraction blank. Benzo(a)anthracene was detected in the sample at greater than five times the level in the blank. Therefore, the data was reported. The recovery for Fluoranthene was 3% above the defined quality control limits, and the data was accepted. Due to the high concentrations of target analytes, the sample extracts had to be diluted. The diluted extracts were analyzed outside of the holding time. The data was accepted because the diluted values from outside the holding time agreed with the undiluted values from within the holding time.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2163173
Collected: 7/27/94 at 08:50

Submitted: 7/28/94 Reported: 9/28/94
Discard: 10/29/94

MA1-SD01-0018-01 Unspiked Composite Sediment
Moss-American Superfund Site - Milwaukee, WI

18SD- SDG#: MOS18-01BKG

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	4.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	4.	
3298	Acenaphthene	17.	2.	mg/kg	33.	4.	
3299	Fluorene	14. J	40.	mg/kg	27.	80.	
3300	Phenanthrene	30.	10.	mg/kg	50.	20.	
3301	Anthracene	4.7 J	10.	mg/kg	9.3	20.	
3302	Fluoranthene	30.	4.	mg/kg	59.	8.	
3303	Pyrene	17.	4.	mg/kg	33.	8.	
3304	Benzo(a)anthracene	5.7	0.2	mg/kg	11.2	0.4	
3305	Chrysene	5.	2.	mg/kg	10.	4.	
3306	Benzo(b)fluoranthene	3.2	0.4	mg/kg	6.3	0.8	
3307	Benzo(k)fluoranthene	2.0	0.4	mg/kg	3.9	0.8	
3308	Benzo(a)pyrene	3.0	0.4	mg/kg	5.9	0.8	
3309	Dibenzo(a,h)anthracene	N.D.	0.2	mg/kg	N.D.	0.4	
3310	Benzo(g,h,i)perylene	2.73	0.05	mg/kg	5.41	0.10	
3311	Indeno(1,2,3-cd)pyrene	2.22	0.05	mg/kg	4.40	0.10	

Benzo(a)anthracene was quantitated in the extraction blank. Benzo(a)anthracene was detected in the sample at greater than five times the level in the blank. Therefore, the data was reported. The recovery for Fluoranthene was 3% above the defined quality control limits, and the data was accepted. Due to the high concentrations of target analytes, the sample extracts had to be diluted. The diluted extracts were analyzed outside of the holding time. The data was accepted because the diluted values from outside the holding time agreed with the undiluted values from within the holding time.

QC
10/14/94

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs



Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2163169
 Collected: 7/27/94 at 08:30

Submitted: 7/28/94 Reported: 9/21/94
 Discard: 10/22/94

MA1-SD01-0017-01 Composite Sediment Sample
 Moss-American Superfund Site - Milwaukee, WI

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

17SD- SDG#: MOS17-15

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	4.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	4.	
3298	Acenaphthene	N.D.	2.	mg/kg	N.D.	4.	
3299	Fluorene	0.10 J	2.	mg/kg	0.19 J	4.	
3300	Phenanthrene	0.6	0.5	mg/kg	1.	1.	
3301	Anthracene	0.23 J	5.	mg/kg	0.45 J	10.	
3302	Fluoranthene	3.	2.	mg/kg	6.	4.	
3303	Pyrene	2.	2.	mg/kg	5.	4.	
3304	Benzo(a)anthracene	0.9	0.1	mg/kg	1.7	0.2	
3305	Chrysene	0.9 J	1.	mg/kg	1.8 J	2.	
3306	Benzo(b)fluoranthene	N.D.	0.9	mg/kg	N.D.	2.	
3307	Benzo(k)fluoranthene	0.5	0.2	mg/kg	1.0	0.4	
3308	Benzo(a)pyrene	1.2	0.2	mg/kg	2.3	0.4	
3309	Dibenzo(a,h)anthracene	N.D.	0.4	mg/kg	N.D.	0.8	
3310	Benzo(g,h,i)perylene	N.D.	0.7	mg/kg	N.D.	1.	
3311	Indeno(1,2,3-cd)pyrene	1.0	0.5	mg/kg	2.	1.	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

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 Group Leader Pesticides/PCBs

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LLI Sample No. SW 2163168

Collected: 7/26/94 at 17:40

Submitted: 7/28/94 Reported: 9/21/94

Discard: 10/22/94

MA1-SD01-0016-01 Composite Sediment Sample
Moss-American Superfund Site - Milwaukee, WI

Account No: 07802
Kerr-McGee Corporation
Technology & Engineering Div.
PO Box 25861
Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
Rel.

16SD- SDG#: MOS17-14

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SWB46/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.		4.
3297	Acenaphthylene	N.D.	3.	mg/kg	N.D.		6.
3298	Acenaphthene	18.	2.	mg/kg	34.		4.
3299	Fluorene	13.	2.	mg/kg	25.		4.
3300	Phenanthrene	33.	0.5	mg/kg	63.		0.9
3301	Anthracene	9.7	0.5	mg/kg	18.		0.9
3302	Fluoranthene	50.	10.	mg/kg	100.		20.
3303	Pyrene	40.	10.	mg/kg	80.		20.
3304	Benzo(a)anthracene	12.	0.5	mg/kg	22.		0.9
3305	Chrysene	12.	5.	mg/kg	22.		9.
3306	Benzo(b)fluoranthene	8.	1.	mg/kg	15.		2.
3307	Benzo(k)fluoranthene	4.	1.	mg/kg	8.		2.
3308	Benzo(a)pyrene	11.	1.	mg/kg	21.		2.
3309	Dibenzo(a,h)anthracene	N.D.	1.	mg/kg	N.D.		2.
3310	Benzo(g,h,i)perylene	N.D.	10.	mg/kg	N.D.		20.
3311	Indeno(1,2,3-cd)pyrene	7.	3.	mg/kg	13.		6.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
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Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2163167
 Collected: 7/26/94 at 17:15

Submitted: 7/28/94 Reported: 9/21/94
 Discard: 10/22/94

MA1-SD01-0015-01 Composite Sediment Sample
 Moss-American Superfund Site - Milwaukee, WI

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

15SD- SDG#: MOS17-13

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.		4.
3297	Acenaphthylene	N.D.	2.	ng/kg	N.D.		4.
3298	Acenaphthene	17.	2.	mg/kg	31.		4.
3299	Fluorene	14.	2.	mg/kg	26.		4.
3300	Phenanthrene	38.	0.5	mg/kg	71.		0.9
3301	Anthracene	8.9	0.5	mg/kg	16.		0.9
3302	Fluoranthene	40.	10.	mg/kg	70.		20.
3303	Pyrene	20.	10.	mg/kg	50.		20.
3304	Benzo(a)anthracene	7.7	0.5	mg/kg	14.		0.9
3305	Chrysene	8.	5.	mg/kg	14.		9.
3306	Benzo(b)fluoranthene	N.D.	5.	mg/kg	N.D.		9.
3307	Benzo(k)fluoranthene	2.	1.	mg/kg	4.		2.
3308	Benzo(a)pyrene	5.	1.	mg/kg	9.		2.
3309	Dibenzo(a,h)anthracene	N.D.	2.	mg/kg	N.D.		4.
3310	Benzo(g,h,i)perylene	N.D.	6.	mg/kg	N.D.		10.
3311	Indeno(1,2,3-cd)pyrene	3.	3.	mg/kg	6.		6.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

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LLI Sample No. SW 2163160
 Collected: 7/26/94 at 12:30

Submitted: 7/28/94 Reported: 9/21/94
 Discard: 10/22/94

MA1-SD01-0008-01 Composite Sediment Sample
 Moss-American Superfund Site - Milwaukee, WI

08SD- SDG#: MOS17-06

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	4.	mg/kg	N.D.	7.	
3297	Acenaphthylene	N.D.	5.	mg/kg	N.D.	9.	
3298	Acenaphthene	380.	2.	mg/kg	690.	4.	
3299	Fluorene	330.	2.	mg/kg	600.	4.	
3300	Phenanthrene	700.	500.	mg/kg	1,300.	900.	
3301	Anthracene	330.	0.5	mg/kg	600.	0.9	
3302	Fluoranthene	300.	200.	mg/kg	600.	400.	
3303	Pyrene	200.	200.	mg/kg	400.	400.	
3304	Benzo(a)anthracene	60.	10.	mg/kg	100.	20.	
3305	Chrysene	63.	0.1	mg/kg	110.	0.2	
3306	Benzo(b)fluoranthene	20.	20.	mg/kg	40.	40.	
3307	Benzo(k)fluoranthene	N.D.	20.	mg/kg	N.D.	40.	
3308	Benzo(a)pyrene	20.	20.	mg/kg	40.	40.	
3309	Dibenzo(a,h)anthracene	N.D.	20.	mg/kg	N.D.	40.	
3310	Benzo(g,h,i)perylene	N.D.	50.	mg/kg	N.D.	90.	
3311	Indeno(1,2,3-cd)pyrene	N.D.	50.	mg/kg	N.D.	90.	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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LLI Sample No. SW 2163153
 Collected: 7/26/94 at 10:45

Submitted: 7/28/94 Reported: 9/21/94
 Discard: 10/22/94

MA1-SD01-0004-01 Composite Sediment Sample
 Moss-American Superfund Site - Milwaukee, WI

04SD- SDG#: MOS17-01

Account No: 07802
 Kerr-McGee Corporation
 Technology & Engineering Div.
 PO Box 25861
 Oklahoma City OK 73125-0861

P.O. MOSS-AMERICAN
 Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED			DRY WEIGHT		
		RESULTS	LIMIT OF QUANTITATION	UNITS	RESULTS	LIMIT OF QUANTITATION	
PAH's in Solids (SW846/8310)							
3296	Naphthalene	N.D.	2.	mg/kg	N.D.	3.	
3297	Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.	
3298	Acenaphthene	34.	2.	mg/kg	50.	3.	
3299	Fluorene	20.	20.	mg/kg	30.	30.	
3300	Phenanthrene	60.	50.	mg/kg	90.	70.	
3301	Anthracene	8.	5.	mg/kg	11.	7.	
3302	Fluoranthene	40.	20.	mg/kg	50.	30.	
3303	Pyrene	20.	2.	ng/kg	30.	3.	
3304	Benzo(a)anthracene	5.3	0.1	mg/kg	7.9	0.1	
3305	Chrysene	6.	1.	mg/kg	8.	1.	
3306	Benzo(b)fluoranthene	N.D.	3.	mg/kg	N.D.	4.	
3307	Benzo(k)fluoranthene	1.3	0.2	mg/kg	1.9	0.3	
3308	Benzo(a)pyrene	2.4	0.2	mg/kg	3.6	0.3	
3309	Dibenzo(a,h)anthracene	1.0	0.2	mg/kg	1.4	0.3	
3310	Benzo(g,h,i)perylene	2.2	0.5	mg/kg	3.3	0.7	
3311	Indeno(1,2,3-cd)pyrene	1.0	0.5	mg/kg	1.4	0.7	

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

Questions? Contact your Client Services Representative
 F. Bradley Ayars at (717) 656-2301



Lancaster Laboratories, Inc.
 2425 New Holland Pike
 Lancaster, PA 17601-5994
 717-656-2301

Respectfully Submitted
 Jenifer E. Hess, B.S.
 Group Leader Pesticides/PCBs

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See reverse side for explanation of symbols and abbreviations.



***** Lancaster Laboratories, Inc. Analytical Report *****
2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 2159604 Account: 07802 Kerr-McGee Corporation
MA1-SD01-0001-01 Composite Sediment Sample
Moss-American Site

ANALYSIS NAME	AS RECEIVED			DRY WEIGHT	
	RESULT	LIMIT OF QUANTITATION	UNITS	RESULT	LIMIT OF QUANTITATION
0111 Moisture	31.3	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1862 PAH's in Solids (SW846/8310)

attached

The surrogate data in the blank, and Anthracene and Benzo(a)anthracene are outside the defined Quality Control Limits. Results for the surrogates and Benzo(a)anthracene in the reprep are within the Limits, however Anthracene is outside the Limits due to suspected interference with closely eluting Decafluorobiphenyl. Hold time had expired prior to the reprep so it can only qualify the original data. Similar results were obtained in the reprep.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

3296 Naphthalene	N.D.	2.	mg/kg	N.D.	3.
3297 Acenaphthylene	N.D.	2.	mg/kg	N.D.	3.
3298 Acenaphthene	1.9 J	2.	mg/kg	2.8 J	3.
3299 Fluorene	N.D.	2.	mg/kg	N.D.	3.
3300 Phenanthrene	2.8	0.5	mg/kg	4.1	0.7
3301 Anthracene	0.7	0.5	mg/kg	1.0	0.7
3302 Fluoranthene	6.2	0.2	mg/kg	9.0	0.3
3303 Pyrene	2.0	0.2	mg/kg	3.0	0.3
3304 Benzo(a)anthracene	0.52	0.01	mg/kg	0.76	0.01
3305 Chrysene	0.6	0.1	mg/kg	0.8	0.1
3306 Benzo(b)fluoranthene	N.D.	0.3	mg/kg	N.D.	0.4
3307 Benzo(k)fluoranthene	0.13	0.02	mg/kg	0.19	0.03
3308 Benzo(a)pyrene	0.52	0.02	mg/kg	0.76	0.03
3309 Dibenzo(a,n)anthracene	0.05	0.02	mg/kg	0.07	0.03
3310 Benzo(g,h,i)perylene	0.34	0.05	mg/kg	0.50	0.07
3311 Indeno(1,2,3-cd)pyrene	0.13	0.05	mg/kg	0.18	0.07

3338 Solid Sample Extract - PAH's	0.00000			0.00000	
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***** Lancaster Laboratories, Inc. Analytical Report *****
2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 2159605 Account: 07802 Kerr-McGee Corporation
Date Submitted: 07/21/94 Date Reported: NOT REP
Date Collected: 07/20/94

MA1-SD01-0002-01 Composite Sediment Sample

**** Lancaster Laboratories, Inc. Analytical Report ****
 2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 2159605 Account: 07802 Kerr-McGee Corporation
 Moss-American Site

AS RECEIVED

DRY WEIGHT

ANALYSIS NAME	LIMIT OF		UNITS	LIMIT OF	
	RESULT	QUANTITATION		RESULT	QUANTITATION
0111 Moisture	26.0	0.5	% by wt.		
"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.					
=====					
1199 Base Neutrals (SW846/8270A)			attached		
3761 naphthalene	12,000.	8,300.	ug/kg	16,000.	11,000.
3765 acenaphthylene	260.	J 330.	ug/kg	350.	J 450.
1191 acenaphthene	57,000.	8,300.	ug/kg	77,000.	11,000.
3768 fluorene	49,000.	8,300.	ug/kg	66,000.	11,000.
3775 phenanthrene	110,000.	8,300.	ug/kg	150,000.	11,000.

1200 Base Neutral cont SW846/8270A attached
 Benzo(b)fluoranthene and benzo(k)fluoranthene were not resolved under the sample analysis conditions. The result reported for benzo(b)fluoranthene represents the combined total of both isomers.

=====					
3776 anthracene	17,000.	8,300.	ug/kg	23,000.	11,000.
3778 fluoranthene	64,000.	8,300.	ug/kg	87,000.	11,000.
1195 pyrene	48,000.	8,300.	ug/kg	65,000.	11,000.
3781 benzo (a) anthracene	12,000.	8,300.	ug/kg	16,000.	11,000.
3782 chrysene	10,000.	8,300.	ug/kg	14,000.	11,000.
3786 benzo (b) fluoranthene	7,500.	J 8,300.	ug/kg	10,000.	J 11,000.
3787 benzo (k) fluoranthene	N.D.	330.	ug/kg	N.D.	450.
3788 benzo (a) pyrene	3,800.	330.	ug/kg	5,100.	450.
3789 indeno (1,2,3-cd) pyrene	900.	330.	ug/kg	1,200.	450.
3790 dibenz (a,h) anthracene	270.	J 330.	ug/kg	360.	J 450.
3791 benzo (ghi) perylene	690.	330.	ug/kg	940.	450.

1862 PAH's in Solids (SW846/8310) attached
 The surrogate data in the blank, and Anthracene and Benzo(a)anthracene are outside the defined Quality Control Limits. Results for the blank and Benzo(a)anthracene in the prep are within the Limits, however Anthracene is outside the Limits due to suspected interference with closely eluting Decafluorobiphenyl. Hold time had expired prior to the prep so it can only qualify the original data. Similar results were obtained in the prep.

The surrogate data is outside the QC limits due to unresolvable matrix problems.

Due to interfering peaks on the chromatogram, the values reported represent the lowest quantitation limits obtainable.

=====					
3296 Naphthalene	N.D.	10.	ng/kg	N.D.	10.
3297 Acenaphthylene	N.D.	2.	ng/kg	N.D.	3.

**** Lancaster Laboratories, Inc. Analytical Report ****
2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 2159605 Account: 07802 Kerr-McGee Corporation

3298	Acenaphthene	71.	2.	mg/kg	95.	3.
3299	Fluorene	58.	2.	mg/kg	79.	3.
3300	Phenanthrene	160.	0.5	mg/kg	220.	0.7
3301	Anthracene	20.	0.5	mg/kg	26.	0.7
3302	Fluoranthene	80.	0.2	mg/kg	110.	0.3
3303	Pyrene	52.	0.2	mg/kg	71.	0.3
3304	Benzo(a)anthracene	13.	0.01	mg/kg	18.	0.01
3305	Chrysene	23.	0.1	mg/kg	31.	0.1
3306	Benzo(b)fluoranthene	N.D.	6.	mg/kg	N.D.	8.
3307	Benzo(k)fluoranthene	5.4	0.02	mg/kg	7.4	0.03
3308	Benzo(a)pyrene	3.1	0.02	mg/kg	4.2	0.03
3309	Dibenzo(a,h)anthracene	1.7	0.02	mg/kg	2.3	0.03
3310	Benzo(g,h,i)perylene	5.0	0.05	mg/kg	6.7	0.07
3311	Indeno(1,2,3-cd)pyrene	1.6	0.05	mg/kg	2.2	0.07

=====

3338 Solid Sample Extract - PAH's 0.00030 0.00000

**** Lancaster Laboratories, Inc. Analytical Report ****
2425 New Holland Pike, Lancaster, PA 17601

Sample Number: SW 2159606 Account: 07802 Kerr-McGee Corporation

Date Submitted: 07/21/94 Date Reported: NOT REP

Date Collected: 07/20/94

MA1-SD01-0002D-01 Composite Sediment Sample
Moss-American Site
Field Duplicate

AS RECEIVED

DRY WEIGHT

ANALYSIS NAME	LIMIT OF			LIMIT OF	
	RESULT	QUANTITATION	UNITS	RESULT	QUANTITATION
0111 Moisture	29.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1199	Base Neutrals (SW846/8270A)			attached		
3761	naphthalene	18,000.	3,300.	ug/kg	26,000.	4,700.
3765	acenaphthylene	N.D.	3,300.	ug/kg	N.D.	4,700.
1191	acenaphthene	110,000.	17,000.	ug/kg	160,000.	24,000.
3768	fluorene	96,000.	17,000.	ug/kg	140,000.	24,000.
3775	phenanthrene	220,000.	17,000.	ug/kg	310,000.	24,000.

=====

1200 Base Neutral cont SW846/8270A attached

Benzo(b)fluoranthene and benzo(k)fluoranthene were not resolved under the sample analysis conditions. The result reported for benzo(b)fluoranthene represents the combined total of both isomers.

The quantitation limits for the GC/MS semivolatile compounds were raised due to the high concentration of target compounds.

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