

RESULTS OF THE SITE INVESTIGATION, PHASE I

at the
**PADUCAH GASEOUS
DIFFUSION PLANT**
Paducah, Kentucky

owned and operated by the
**U.S. DEPARTMENT
OF ENERGY**

and managed by
**MARTIN MARIETTA
ENERGY SYSTEMS, INC.**

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VOL. 1 OF 5

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The radiological survey consisted of three parts: (1) a walkover survey of each bank of the creeks and ditches, using high-efficiency gamma scintillation detectors (SPA-3 sodium iodide detectors); (2) ground-contact open- and closed-window point measurements at 500-foot intervals along each bank of the creeks and ditches, using thin-end window G.M. detectors; and (3) soil sampling at two background stations and four stations where the surveys showed elevated radioactivity on the banks of the creeks and ditches. Soil samples were analyzed for radioactivity (see Table 2-3). Figure 2-6 shows the five stations (designated "RS") at which soil samples were collected during the radiological survey. Based on the results of this sampling, an extensive sampling of creek-bank soil was performed (see subsection 2.4.2.3).

2.3.6 SOIL GAS SURVEY

A soil gas survey was conducted in June and July of 1990 to (1) assess the extent of volatile organic contamination around the C-400 building where TCE was known to have been released, (2) assess the presence of VOCs beneath other onsite plant areas where source releases or contaminant migration may have occurred, and (3) assess the potential for migration of contaminants along the beddings of raw water and natural-gas pipelines. The technical memorandum on the soil gas survey is in Appendix 2B-18. The locations of the sampling stations are shown in Figure 2-7.

Sampling stations for soil gas were spaced at 250-foot intervals around the C-400 building and at 750-foot intervals in the remaining survey areas. Sampling stations were established by driving a soil gas probe to a depth of about 4 feet below ground surface. The probe consisted of an outer steel well point with inner stainless steel intake fittings and discharge tubes. A Gillian sampling pump was used to withdraw soil gas (both in purging the hole and in collecting the sample) through the probe into a Tedlar sample bag. The samples were sent to an offsite laboratory and were analyzed for TCE, 1,1,1-trichloroethylene, dichloroethane, dichloroethene, and vinyl chloride.

2.3.7 INITIAL CHARACTERIZATION OF USTs C-750-A AND C-750-B

Leaking from USTs C-750-A and C-750-B was suspected when elevated readings for organic vapors were discovered in PGDP monitoring Well 69 (MW-69), which is located approximately 500 feet northeast of building C-750. Beginning on August 2, 1989, CDM Federal Programs Corporation performed a preliminary site investigation in the vicinity of the C-750 garage building (see Figure 2-8) after leaking was discovered in USTs C-750-A and C-750-B (CDM, 1989a). Tests of tank tightness confirmed leakage at rates of 0.10 and 0.27 gallon per hour for C-750-A and C-750-B, respectively. The tank system near the C-750 garage building includes one 10,000-gallon unleaded-gasoline UST (C-750-A), one 10,000-gallon diesel-fuel UST (C-750-B), one empty 1,000-gallon waste-oil UST (C-750-C), and an empty 8,000-gallon uranium- and PCB-contaminated waste-oil UST (C-750-D). Two other USTs are at the C-200 and C-710 buildings. C-200-A is an empty 500-gallon gasoline UST, and C-710-B is an empty 250-gallon gasoline UST. One aboveground alcohol-storage tank is also located near the

**RESULTS OF THE
SITE INVESTIGATION,
PHASE I**

at the
**PADUCAH GASEOUS
DIFFUSION PLANT**
Paducah, Kentucky

owned and operated by the
**U.S. DEPARTMENT
OF ENERGY**

and managed by
**MARTIN MARIETTA
ENERGY SYSTEMS, INC.**

March 22, 1991

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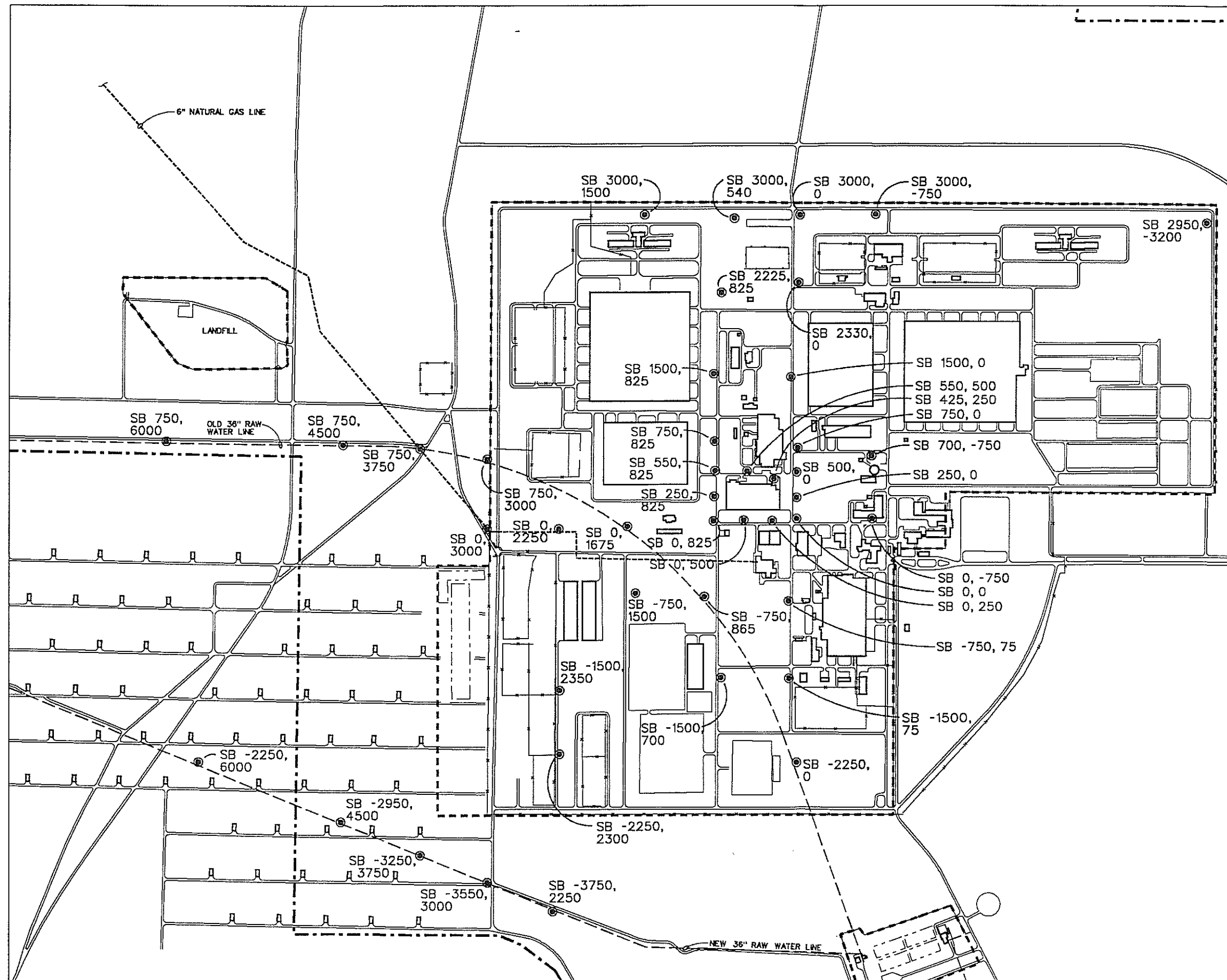
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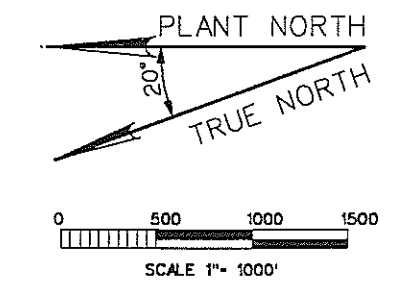
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LEGEND

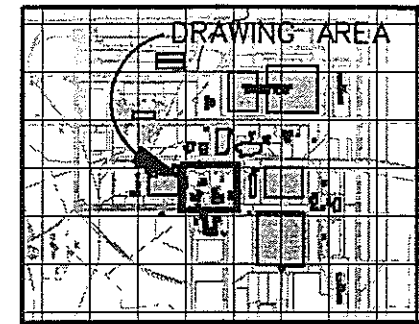
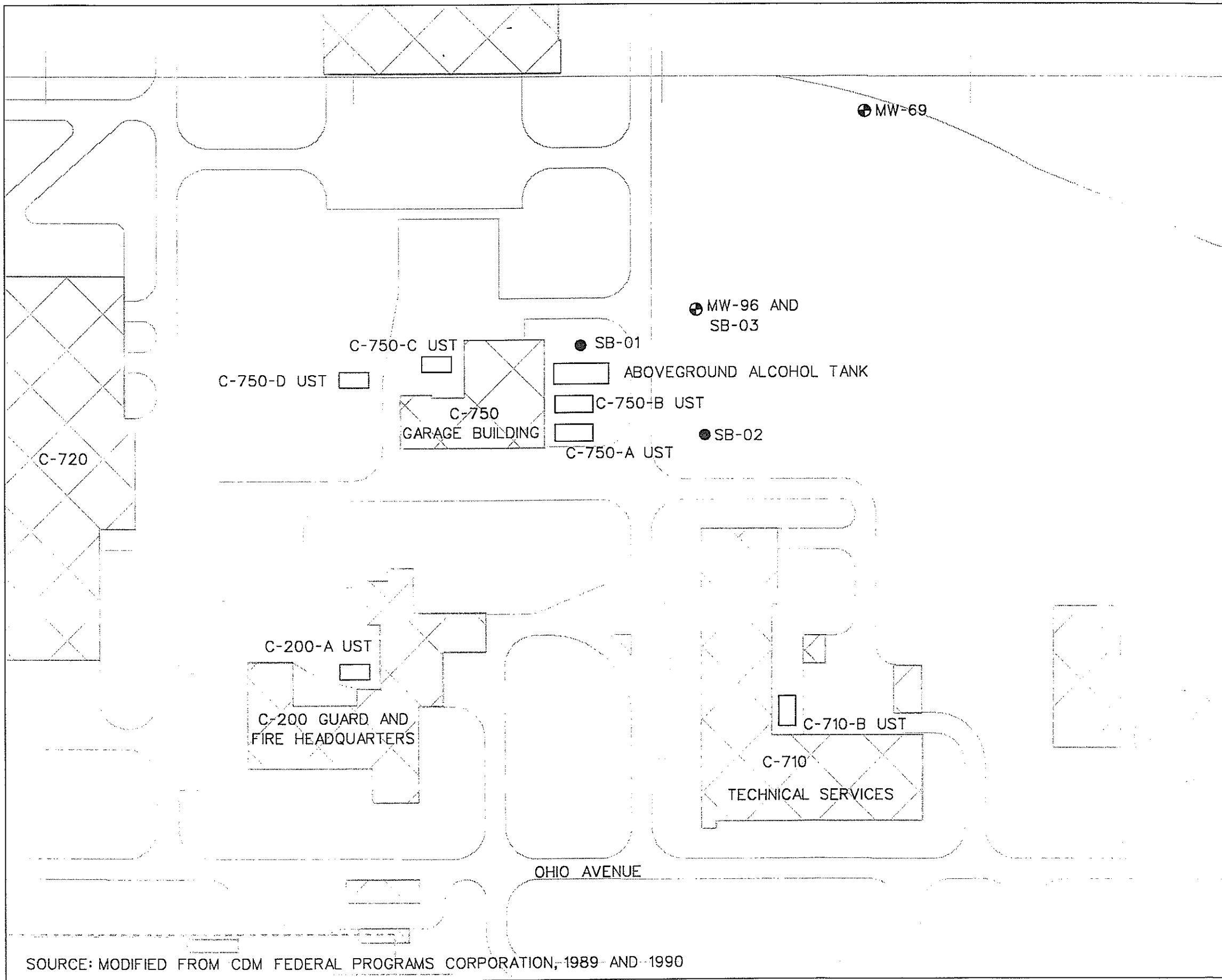
- DOE BOUNDARY
- - - WATER LINE
- - - FENCE
- - - NATURAL GAS PIPELINE
- SOIL GAS SAMPLING LOCATIONS
- SB 3000,1500 STATION NUMBER COORDINATES (X,Y)



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 PADUCAH GDP, KY.
 SITE INVESTIGATION, PHASE I

Figure 2-7
 SAMPLING STATIONS FOR SOIL GAS





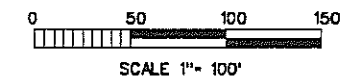
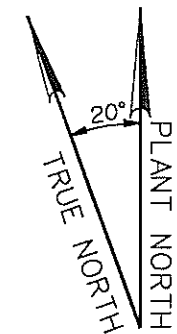
KEY MAP

LEGEND

- SOIL BORING
- ⊕ PLANT WELL

TANK #	SIZE (gal)	CONTENTS	STATUS
C-750-A	10,000	UNLEADED GASOLINE	140 gal REMAINS
C-750-B	10,000	DIESEL	160 gal REMAINS
C-750-C	1,000	WASTE OIL	EMPTY
C-750-D*	8,000	WASTE OIL W/ U AND PCBS	EMPTY*
C-710-B	200	GASOLINE	EMPTY
C-200-A	500	GASOLINE	EMPTY

*SINCE THE C-750-D TANKS CONTAINED WASTE OILS CONTAMINATED BY U AND PCBS, ITS CHARACTERIZATION WILL BE ADDRESSED BY THE HSWA PERMIT AND NOT BY THIS INVESTIGATION.



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 SITE INVESTIGATION, PHASE I
 Figure 2-8

LOCATIONS OF SOIL BORINGS, MONITORING WELLS, AND SOIL GAS SURVEY IN THE VICINITY OF THE C-750 GARAGE BUILDING



APPENDIX 2B-18
SOIL GAS SURVEY

DATE: August 1, 1990
PREPARED BY: Kevin Cange/ORO
SUBJECT: Soil Gas Survey
PROJECT: SED28178.TM

INTRODUCTION

PURPOSE AND SCOPE

A soil gas survey was performed at the PGDP from June 26, 1990, through July 2, 1990. This technical memorandum presents the criteria used for selecting the soil gas sample locations, the methods used to collect the soil gas samples, and the results obtained from the sample analyses.

METHODOLOGY

SAMPLE LOCATION SELECTION

The scope of work described in the Soil Gas Project Instructions included the collection of soil gas samples at 50 locations. Sample locations were selected to satisfy 3 requirements of the study: 1) to assess the extent of volatile organic contamination around the C-400 building where a known release of trichloroethylene (TCE) had occurred, 2) to assess the presence of volatile organic compounds beneath other onsite plant areas where source releases or contaminant migration may have occurred, and 3) to assess potential contaminant migration pathways from onsite sources to offsite receptors via pipeline beddings of the raw water supply lines and the natural gas supply line.

A two-dimensional coordinate system was established for selecting sample locations. The origin of the system was placed at the southeast corner of the intersection of Tennessee Avenue (x-axis) and Tenth Street (y-axis). Sample locations were designated by their respective "x,y" coordinates.

Spacing for the sample locations around the C-400 building was established at 250-ft intervals; the remainder of the sample locations were sited at 750-ft intervals. These intervals were selected to provide more detailed coverage of the C-400 building while providing broader coverage for the other onsite and offsite study areas. Sample locations are shown on Figure 1.

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PGDP PHASE I SITE INVESTIGATION

Page 2

August 1, 1990

SED28178.TM

All sample locations were staked in the field prior to sample collection to facilitate Energy Systems' excavation permit review. Of the 50 sites originally selected, Energy Systems approved 43 for sample collection. Sample locations denied excavation permits by the PGDP NEPA representative were (-2800,3000), (-3000,2250), (-3000,1500), (-2250,1600), (-2250,750), (-1500,1675), and (1300,6000). All of these sites were located in the northwest quadrant of the site, with the exception of (1300,6000) which was located near the landfill north of Ogden Landing Road.

SAMPLE COLLECTION AND MANAGEMENT

Soil gas sampling was performed from June 27, 1990, through July 2, 1990, by Bryan Laude/CH2M HILL, Dennis Frain/TMA Eberline, and John Taylor/TMA Eberline. Escorting was provided by Paul Graves and Charles Leneave. The soil gas probe was driven into the ground a distance of approximately 4 ft. After purging a prescribed volume of soil gas using a Gillian pump, the soil gas samples were collected into Tedlar bags and sent to CH2M HILL's Montgomery, Alabama, laboratory for analysis. The specific soil gas sampling methodology is described in detail in the Soil Gas Project Instructions.

Equipment blanks were collected at the beginning of each day; one duplicate sample was collected per ten field samples. All samples were sent to CH2M HILL's Montgomery, Alabama, laboratory for analyses of TCE, vinyl chloride, 1,1,1-trichloroethane (TCA), total dichloroethenes, and total dichloroethanes (all degradation products of TCE).

A total of 41 soil gas samples were collected, 2 less than approved. Samples were not collected at locations (1500,0) and (3000,-750). Refusal of the soil gas probe was encountered at site (1500,0). Saturated soil conditions prevented sample collection at location (3000,-750). Sample collection at all locations was more difficult than expected due to the tightness of the soil formation being sampled.

Results of the sample analyses are summarized in Table 1. Of the 41 samples analyzed, TCE only was reported at locations (425,250) and (0,825). TCA only was reported at 9 separate locations. All other parameters were reported below method detection limits. Figure 2 illustrates the data presented in Table 1. Raw analytical data sheets are provided in Appendix 1.

Table 1
Soil Gas Sampling Results

Location	Vinyl Chloride	1,1,1-TCA	TCE	Total DCE	Total DCA
0,-750	--	0.26	--	--	--
700,750	--	--	--	--	--
-2250,0	--	--	--	--	--
0,0	--	--	--	--	--
250,0	--	--	--	--	--
500,0	--	--	--	--	--
750,0	--	--	--	--	--
2330,0	--	--	--	--	--
3000,0	--	--	--	--	--
-1500,75	--	--	--	--	--
-750,75	--	--	--	--	--
0,250	--	--	--	--	--
425,250	--	--	2.90	--	--
0,500	--	0.70	--	--	--
550,500	--	--	--	--	--
3000,540	--	--	--	--	--
-1500,700	--	--	--	--	--
-2250,750	--	--	--	--	--
0,825	--	--	0.28	--	--
250,825	--	--	--	--	--
550,825	--	--	--	--	--
750,825	--	0.30	--	--	--
1500,825	--	0.26	--	--	--
2250,825	--	--	--	--	--
-750,865	--	--	--	--	--
-750,1500	--	--	--	--	--
3000,1500	--	--	--	--	--
0,1675	--	--	--	--	--
-3750,2250	--	0.20	--	--	--
0,2250	--	--	--	--	--
-2250,2300	--	--	--	--	--
-1500,2350	--	0.27	--	--	--
-3550,3000	--	--	--	--	--

Table 1 Soil Gas Sampling Results					
Location	Vinyl Chloride	1,1,1-TCA	TCE	Total DCE	Total DCA
0,3000	--	0.20	--	--	--
750,3000	--	--	--	--	--
-3250,3750	--	--	--	--	--
750,3750	--	--	--	--	--
-2950,4500	--	--	--	--	--
750,4500	--	--	--	--	--
-2250,6000	--	--	--	--	--
750,6000	--	--	--	--	--

Notes: -- = no contamination detected.
Results reported in ppm.

OROC1/067.51

DECONTAMINATION OF EQUIPMENT

All reusable sampling equipment was decontaminated between sample locations using the procedures described in Energy Systems' Environmental Surveillance Procedures ESP-900.

MANAGEMENT OF INVESTIGATION-DERIVED WASTES

The only waste generated during the investigation was personal protective equipment (PPE). All PPE wastes were bagged and turned over to the CH2M HILL Waste Manager for management in accordance with the CH2M HILL and Energy Systems waste management plans.

INTERPRETATION

Data collected from locations (0,500) and (425,250) around the C-400 building indicate the presence of TCE and TCA. These data are probably the result of the documented TCE release next to the southeast corner of the C-400 building. TCE and TCA results reported at locations (0,825), (750,825), and (1500,825) are likely the result of contaminant migration from the C-400 TCE spill. The horizontal extent of volatile organic contamination resulting from the C-400 TCE spill is difficult to assess, given the soil conditions encountered during sampling and the spacing between sample locations.

The TCA reported at location (0,-750) is not near an area known to be contaminated with TCE. Location (0,-750) is next to the laboratory building C-710.

The presence of TCE documented at boring H003 may be related to the TCA concentrations reported at soil gas locations (-3750,2250), (-1500,2350), and (0,3000). This, however, is unsubstantiated given the lack of soil gas data between H003 and the reported TCA concentrations.

Data collected along the new and old raw water lines and the natural gas pipeline are suspect because the sample locations were moved in the excavation permit review process. Original sample locations were staked alongside of the buried utilities to sample soil gas in the pipeline bedding material. Energy Systems moved these locations to avoid potential damage to the pipelines. By doing so, the soil gas

**TECHNICAL MEMORANDUM NO. 18
PGDP PHASE I SITE INVESTIGATION**

Page 4

August 1, 1990

SED28178.TM

samples collected may not be representative of the soil gas present in the bedding material.

DISCUSSION AND RECOMMENDATIONS

Further assessment of volatile organic contamination around the C-400 and C-710 buildings is recommended to delineate the horizontal extent of contamination. Closer spacing of samples representing soil gas from a deeper strata (10 ft below land surface) in addition to selected soil sampling and analysis for volatile organics is recommended.

Further assessment of volatile organic contamination in the northwest quadrant of the plant and along the pipeline beddings is recommended, assuming approval of excavation permits can be obtained.

REFERENCES

CH2M HILL Soil Gas Survey Project Instructions
Martin Marietta Energy Systems Environmental Surveillance Procedures

APPENDICES

1. Raw Analytical Data

Appendix 1
RAW ANALYTICAL DATA

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CH2M HILL Laboratory No. 16253

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List of Organic Sample ID Qualifiers	iii
Sample Cross-reference	iv
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Analytical Results of Field Samples	
SG SBEQBLK01 (LMG #16253001)	1
SG SB425 250 (LMG #16253002)	2
SC SBO 250 (LMG #16253003)	3
Quality Control Data	
Results of Method Blank (T06280B1)	4
Copy of Chain-of-custody	5

ANALYTICAL METHODOLOGY

Organic Analysis

Priority Pollutants: Water, soil and waste samples are analyzed in accordance with procedures described in Methods 608, 624, and 625, EPA-600/4-82-057 (1982); Methods 8080, 8240, and 8270, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition; and methods outlined in the USEPA Contract Laboratory Program Statement of Work for Organics Analysis, February, 1988.

Volatile Analysis (Safe Drinking Water Act): Water samples are analyzed in accordance with procedures described in Method 524.2, Federal Register (50 FR 46902), November 13, 1985.

Chlorinated Phenoxyacid Herbicides: Samples are analyzed with procedures described in Method 8150, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Organophosphate Pesticides: Samples are analyzed in accordance with procedures described in Methods 614 and 622, EPA-600/4-79-019 (1979) and in Method 8140, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Phenol Analysis by GC: Samples are analyzed in accordance with procedures outlined in Method 604, Federal Register, 40 CFR, Part 136 (July 1, 1987) and in Method 8040, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Polynuclear Aromatic Hydrocarbons (GC analysis): Samples are analyzed with procedures described in Method 610, Federal Register, 40 CFR, Part 136 (July 1, 1987) and in Method 8100, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Ethylene Dibromide : Water samples are analyzed in accordance with procedures outlined in Method 504, Federal Register (50 FR 46902), November 13, 1985.

Trihalomethanes: Water samples are analyzed with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

- U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.
- J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated PQL. The "J" qualifier is not used with pesticide results.
- C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.
- D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.
- A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.
- X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.
- JX -- This value is less than the sample quantitation limit that would have been displayed for "U".

CLIENT SAMPLE ID QUALIFIERS

LEVEL 1

The qualifiers that GC/MS uses with the client sample ID are defined below:

- DL -- Dilution Run
- R -- Rerun (may be followed by a digit to indicate multiple reruns)
- RD -- Diluted Rerun
- RX -- Re-extraction Analysis
- MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)
- MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)
- QC_BLANK -- Method Blank (may be followed by an S for soils run at a low level, W for waters, or SM for soils run at a medium level) (letters may be followed by a digit to indicate multiple blanks of that type; if there are no letters the digit indicates multiple blanks).

These qualifiers allow GC/MS to have unique client sample ID's so that the client can get more accurate information from the data reported.

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 16253

<u>CH2M HILL Sample No.</u>	<u>Sample Description</u>			
16253001	SAMPLE SG SBEQBLK01	06/27/90	1000	GRAB
16253002	SAMPLE SG SB 425, 250	06/27/90	1615	GRAB
16253003	SAMPLE SC SBO, 250	06/27/90	1643	GRAB



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16253001
 Client Sample ID: SG SBEQBLK01

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/28/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	98			
	1,4-Bromofluorobenzene - SS	103			
	1,2-Dichloroethane-d4 - SS	105			

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

MSC

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Sub Sample ID: 16253002
 Client Sample ID: SG SB425 250

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 06/28/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	390		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	104		
	1,4-Bromofluorobenzene - SS	97		
	1,2-Dichloroethane-d4 - SS	114		

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

$$TCE = \left[\frac{\frac{390}{25} \times 24.5}{131.40} \right] \text{ ppm}$$

$$TCE = 2.91 \text{ ppm}$$

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16253003
Client Sample ID: SC SBO 250

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/28/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	100		
	1,4-Bromofluorobenzene - SS	101		
	1,2-Dichloroethane-d4 - SS	104		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

000003

use



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: T0628081
Client Sample ID: QC BLANK A

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/28/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	100			
	1,4-Bromofluorobenzene - SS	102			
	1,2-Dichloroethane-d4 - SS	104			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

MSC



Received
7/17/90
ORO

July 11, 1990

SED28178.LA

Mr. James Moore
CH2M HILL/ORO
599 Oak Ridge Turnpike
Oak Ridge, TN 37830

RE: Analytical Data for Paducah Gaseous Diffusion Plant, Laboratory No. 16263


Dear Mr. Moore:

On June 29, 1990, the CH2M Hill Montgomery Laboratory received ten samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. No unusual difficulties were encountered during the analysis of these samples.

If you should have any questions concerning the data, please inquire.

Sincerely,


Ward Dickens
Organics Division Manager

Enclosures

cc: Mr. Craig Vinson

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CH2M HILL Laboratory No. 16263

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List of Organic EPA-defined Qualifiers	ii
List of Organic Sample ID Qualifiers	iii
Sample Cross-reference	iv
 VOLATILE DATA	
Analytical Results of Field Samples	
SG SBEQBLK02 (LMG #16263001)	1
SG SB 0 0 (LMG #16263002)	2
SG SB250 0 (LMG #16263003)	3
SG SB550 500 (LMG #16263004)	4
SG SB750 825 (LMG #16263005)	5
SGSBFR750 825 (LMG #16263006)	6
SG SB1500 825 (LMG #16263007)	7
SG SB2225 825 (LMG #16263008)	8
SG SB700 -750 (LMG #16263009)	9
SG SB0 -750 (LMG #16263010)	10
Quality Control Data	
Results of Method Blank (T06300B1)	11
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ANALYTICAL METHODOLOGY

Organic Analysis

Priority Pollutants: Water, soil and waste samples are analyzed in accordance with procedures described in Methods 608, 624, and 625, EPA-600/4-82-057 (1982); Methods 8080, 8240, and 8270, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition; and methods outlined in the USEPA Contract Laboratory Program Statement of Work for Organics Analysis, February, 1988.

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Organophosphate Pesticides: Samples are analyzed in accordance with procedures described in Methods 614 and 622, EPA-600/4-79-019 (1979) and in Method 8140, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Phenol Analysis by GC: Samples are analyzed in accordance with procedures outlined in Method 604, Federal Register, 40 CFR, Part 136 (July 1, 1987) and in Method 8040, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

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Trihalomethanes: Water samples are analyzed with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

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ORGANICS

Definitions for the EPA-defined qualifiers:

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- J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated PQL. The "J" qualifier is not used with pesticide results.
- C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.
- D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.
- A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.
- X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.
- JX -- This value is less than the sample quantitation limit that would have been displayed for "U".

CLIENT SAMPLE ID QUALIFIERS

LEVEL 1

The qualifiers that GC/MS uses with the client sample ID are defined below:

- DL -- Dilution Run
- R -- Rerun (may be followed by a digit to indicate multiple reruns)
- RD -- Diluted Rerun
- RX -- Re-extraction Analysis
- MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)
- MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)
- QC_BLANK -- Method Blank (may be followed by an S for soils run at a low level, W for waters, or SM for soils run at a medium level) (letters may be followed by a digit to indicate multiple blanks of that type; if there are no letters the digit indicates multiple blanks).

These qualifiers allow GC/MS to have unique client sample ID's so that the client can get more accurate information from the data reported.

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 16263

<u>CH2M HILL Sample No.</u>	<u>Sample Description</u>		
16263001	SG SBEQBLK02	06/28/90	0850
16263002	SG SB, 0, 0	06/28/90	0905
16263003	SG SB250, 0	06/28/90	1000
16263004	SG SB550, 500	06/28/90	1035
16263005	SG SB750, 825	06/28/90	1107
16263006	SG SBFR750, 825	06/28/90	1136
16263007	SG SB1500, 825	06/28/90	1359
16263008	SG SB2225, 825	06/28/90	1405
16263009	SG SB700, -750	06/28/90	1513
16263010	SG SB0, -750	06/28/90	1532



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: I6263001
Client Sample ID: SG SBEQBLK02

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	100		
	1,4-Bromofluorobenzene - SS	95		
	1,2-Dichloroethane-d4 - SS	118		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

000001

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: I6263002
Client Sample ID: SG SB 0 0

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	102			
	1,4-Bromofluorobenzene - SS	96			
	1,2-Dichloroethane-d4 - SS	111			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: I6263003
Client Sample ID: SG SB250 0

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	100		
	1,4-Bromofluorobenzene - SS	94		
	1,2-Dichloroethane-d4 - SS	129		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16263004
Client Sample ID: SG SB550 500

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	103		
	1,4-Bromofluorobenzene - SS	92		
	1,2-Dichloroethane-d4 - SS	115		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16263005
 Client Sample ID: SG SB750 825

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	41		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	100		
	1,4-Bromofluorobenzene - SS	93		
	1,2-Dichloroethane-d4 - SS	126		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1, \text{TCA} = \left[\frac{\frac{41}{25} \times 24.5}{133.42} \right] \text{ppm}$$

$$1,1,1, \text{TCA} = 0.30 \text{ ppm}$$

000005

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Sample ID: 16263006
 Client Sample ID: SGSBFR750 825

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	69			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	98			
	1,4-Bromofluorobenzene - SS	97			
	1,2-Dichloroethane-d4 - SS	112			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{69}{25} \times 24.5}{133.42} \right] \text{ ppm}$$

$$1,1,1\text{-TCA} = 0.51 \text{ ppm}$$

000006

Msc

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16263007
 Client Sample ID: SG SBI500 825

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	36		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	103		
	1,4-Bromofluorobenzene - SS	98		
	1,2-Dichloroethane-d4 - SS	121		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{36}{25} \times 24.5}{133.42} \right] \text{ ppm}$$

$$1,1,1\text{-TCA} = 0.26 \text{ ppm}$$

Msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Sample ID: 16263008
Client Sample ID: SG SB2225 825

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	102			
	1,4-Bromofluorobenzene - SS	93			
	1,2-Dichloroethane-d4 - SS	123			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: I6263009
Client Sample ID: SG SB700 -750

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	99		
	1,4-Bromofluorobenzene - SS	95		
	1,2-Dichloroethane-d4 - SS	130		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

MSC

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16263010
 Client Sample ID: SG SBO -750

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	36		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	103		
	1,4-Bromofluorobenzene - SS	94		
	1,2-Dichloroethane-d4 - SS	116		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{36}{25} \times 24.5}{133.42} \right] \text{ ppm}$$

$$1,1,1\text{-TCA} = 0.26 \text{ ppm}$$

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: T06300B1
Client Sample ID: QC BLANK A

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	97		
	1,4-Bromofluorobenzene - SS	97		
	1,2-Dichloroethane-d4 - SS	108		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

Cram Hill QUALITY ANALYTICS
CHAIN OF CUSTODY RECORD

4/18/90

PROJECT NUMBER 1-1 SED28178, F603		PROJECT NAME Paducah Gaseous Diffusion Plant		CLIENT ADDRESS AND PHONE NUMBER CH2M HILL, 599 Oak Ridge Turnpike, Suite 102 Oak Ridge, TN 37830 (615)483-9032											
CLIENT NAME CH2M HILL		COPY TO: Sample Manager		ANALYSES REQUESTED											
PROJECT MANAGER Jim Moore		LABORATORY MGM		Total Metals Dissolved Metals Pest/PCB/BNA VOC, TCE Alkalinity Chloride & Sulfate Sulfide Nitrate-Nitrite TDS & ISS											
REQUESTED TURNAROUND TIME: WITHIN 10-DAYS-		SAMPLE MATRIX		DATE		TIME		COM P		G R A B		# OF CONTAINERS		HAZWRAP/NEESA QC LEVEL	
STA NO.	DATE	TIME	SAMPLE MATRIX	SAMPLE NUMBER	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME	DATE/TIME
	6/28/90	0850	SG	SB EQ BLK 2	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30	6-28-90 16:30
	6/28/90	0905	SG	SB, A, B											
	6/28/90	1000	SG	SB 250, 0											
	6/28/90	1035	SG	SB 550, 500											
	6/28/90	1107	SG	SB 750, 825											
	6/28/90	1136	SG	SB ER 750, 825											
		1359	SG	SB 1500, 825											
		1405	SG	SB 2225, 825											
		1513	SG	SB 700, 750											
		1532	SG	SB 0, 750											
SAMPLED BY AND TITLE Debra L. Lusk		RECEIVED BY: Debra L. Lusk		DATE/TIME 6-28-90 16:15		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30	
RECEIVED BY: Debra L. Lusk		RECEIVED BY: Debra L. Lusk		DATE/TIME 6-28-90 16:15		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30	
RECEIVED BY: Debra L. Lusk		RECEIVED BY: Debra L. Lusk		DATE/TIME 6-28-90 16:15		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30	
RECEIVED BY LAB: Debra L. Lusk		RECEIVED BY LAB: Debra L. Lusk		DATE/TIME 6-28-90 16:15		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30		DATE/TIME 6-28-90 16:30	
REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure		REMARKS See Herb Kelly for Analytical Procedure	

210000

JUL 16 1990

CH2M Hill

July 12, 1990

SED28178.LA

Mr. James Moore
CH2M HILL/ORO
599 Oak Ridge Turnpike
Oak Ridge, TN 37830

RE: Analytical Data for Paducah Gaseous Diffusion Plant, Laboratory No. 16269

Dear Mr. Moore:

On June 30, 1990, the CH2M Hill Montgomery Laboratory received nine samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. No unusual difficulties were encountered during the analysis of these samples.

If you should have any questions concerning the data, please inquire.

Sincerely,



Ward Dickens
Organics Division Manager

Enclosures

cc: Mr. Craig Vinson

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SB500 0 (LMG #16269001)	1
SB750 0 (LMG #16269002)	2
SB2330 0 (LMG #16269003)	3
SB3000 540 (LMG #16269004)	4
SBEQBLK03 (LMG #16269005)	5
SB2950 -3200 (LMG #16269006)	6
SBO 500 (LMG #16269007)	7
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Quality Control Data	
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ANALYTICAL METHODOLOGY

Organic Analysis

Priority Pollutants: Water, soil and waste samples are analyzed in accordance with procedures described in Methods 608, 624, and 625, EPA-600/4-82-057 (1982); Methods 8080, 8240, and 8270, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition; and methods outlined in the USEPA Contract Laboratory Program Statement of Work for Organics Analysis, February, 1988.

Volatile Analysis (Safe Drinking Water Act): Water samples are analyzed in accordance with procedures described in Method 524.2, Federal Register (50 FR 46902), November 13, 1985.

Chlorinated Phenoxyacid Herbicides: Samples are analyzed with procedures described in Method 8150, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Organophosphate Pesticides: Samples are analyzed in accordance with procedures described in Methods 614 and 622, EPA-600/4-79-019 (1979) and in Method 8140, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Phenol Analysis by GC: Samples are analyzed in accordance with procedures outlined in Method 604, Federal Register, 40 CFR, Part 136 (July 1, 1987) and in Method 8040, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Polynuclear Aromatic Hydrocarbons (GC analysis): Samples are analyzed with procedures described in Method 610, Federal Register, 40 CFR, Part 136 (July 1, 1987) and in Method 8100, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

Ethylene Dibromide : Water samples are analyzed in accordance with procedures outlined in Method 504, Federal Register (50 FR 46902), November 13, 1985.

Trihalomethanes: Water samples are analyzed with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

- U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.
- J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated PQL. The "J" qualifier is not used with pesticide results.
- C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.
- D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.
- A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.
- X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.
- JX -- This value is less than the sample quantitation limit that would have been displayed for "U".

CLIENT SAMPLE ID QUALIFIERS

LEVEL 1

The qualifiers that GC/MS uses with the client sample ID are defined below:

- DL -- Dilution Run
- R -- Rerun (may be followed by a digit to indicate multiple reruns)
- RD -- Diluted Rerun
- RX -- Re-extraction Analysis
- MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)
- MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)
- QC_BLANK -- Method Blank (may be followed by an S for soils run at a low level, W for waters, or SM for soils run at a medium level) (letters may be followed by a digit to indicate multiple blanks of that type; if there are no letters the digit indicates multiple blanks).

These qualifiers allow GC/MS to have unique client sample ID's so that the client can get more accurate information from the data reported.

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 16269

<u>CH2M HILL</u> <u>Sample No.</u>	<u>Sample Description</u>		
16269001	SAMPLE SB500, 0	06/29/90	0820
16269002	SAMPLE SB750, 0	06/29/90	0828
16269003	SAMPLE SB2330, 0	06/29/90	0923
16269004	SAMPLE SB3000, 540	06/29/90	0952
16269005	SAMPLE SBEQBLK03	06/29/90	1011
16269006	SAMPLE SB2950, -3200	06/29/90	1101
16269007	SAMPLE SB0, 500	06/29/90	1315
16269008	SAMPLE SB250, 825	06/29/90	1323
16269009	SAMPLE SB-1500, 700	06/29/90	1513

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16269001
 Client Sample ID: SB500 0

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	102		
	1,4-Bromofluorobenzene - SS	94		
	1,2-Dichloroethane-d4 - SS	122		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

NSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16269002
Client Sample ID: SB750 0

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	102		
	1,4-Bromofluorobenzene - SS	91		
	1,2-Dichloroethane-d4 - SS	118		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16269003
 Client Sample ID: SB2330 0

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	104		
	1,4-Bromofluorobenzene - SS	90		
	1,2-Dichloroethane-d4 - SS	125		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

Handwritten signature

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16269004
 Client Sample ID: SB3000 540

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	100		
	1,4-Bromofluorobenzene - SS	95		
	1,2-Dichloroethane-d4 - SS	116		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

Msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16269005
Client Sample ID: SBEQBLK03

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	101			
	1,4-Bromofluorobenzene - SS	90			
	1,2-Dichloroethane-d4 - SS	114			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16269006
Client Sample ID: SB2950 -3200

Concentration: LOW
Sample Matrix: AIR
Percent Moisture:

Date Extracted:
Date Analyzed: 06/30/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	99		
	1,4-Bromofluorobenzene - SS	94		
	1,2-Dichloroethane-d4 - SS	107		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16269007
 Client Sample ID: SBO 500

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture:

Date Extracted:
 Date Analyzed: 06/30/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane . . .	94		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL) . .	ND		
	Dichloroethanes (TOTAL) . .	ND		

	Toluene-d8 - SS	104		
	1,4-Bromofluorobenzene - SS	92		
	1,2-Dichloroethane-d4 - SS	106		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{94}{25} \times 24.5}{133.42} \right] \text{ ppm}$$

$$1,1,1\text{-TCA} = 0.69 \text{ ppm}$$

NSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16269008
Client Sample ID: SB250 825

Concentration: LOW
Sample Matrix: AIR
Percent Moisture:

Date Extracted:
Date Analyzed: 07/01/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	104			
	1,4-Bromofluorobenzene - SS	92			
	1,2-Dichloroethane-d4 - SS	113			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16269009
Client Sample ID: SB1500 700

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/01/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	97			
	1,4-Bromofluorobenzene - SS	100			
	1,2-Dichloroethane-d4 - SS	117			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: T06300B1
 Client Sample ID: QC BLANK A

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 06/30/
 Dilution Factor: 1

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	97		
	1,4-Bromofluorobenzene - SS	97		
	1,2-Dichloroethane-d4 - SS	108		

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

MSC

CHAM HILL QUALITY ANALYTICS

CHAIN OF CUSTODY RECORD

PROJECT NUMBER 5ED28178.FG		PROJECT NAME P&DP		CLIENT ADDRESS AND PHONE NUMBER 549 Oak Ridge Twp, Suite 102 Clark Ridge, TN 37130 (615) 483-9032		FOR LAB USE ONLY	
CLIENT NAME CH2M Hill		PROJECT MANAGER Jim Moore		ANALYSES REQUESTED		LAB# 16269	
PROJECT MANAGER COPY TO: Sample Manager		SAMPLING REQUIREMENTS SDWA <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>		NO. OF CONTAINERS		LAB#	
REQUESTED COMP. DATE		SAMPLE DESCRIPTIONS (12 CHARACTERS)		NO. OF SAMP		PG	
SIA NO.	DATE	TIME				OF	
	1990					1	
	6/29	0820	SB 500,0	1			
	6/29	0828	SB 750,0	1			
	6/29	0923	SB 2330,0	1			
	6/29	0952	SB 3000,540	1			
	6/29	1011	SB EQBLK 03	1			
	6/29	1101	SB 2950,-3200	1			
		1315	SB 0,500	1			
		1323	SB 250,825	1			
		1513	SB -1500,700	1			
			V. low volume in bag	9			
RELINQUISHED BY: Ryan Leude		DATE/TIME 6-29-90 16:15		RELINQUISHED BY:		DATE/TIME	
RECEIVED BY: Ryan Leude		DATE/TIME 6-29-90 17:00		RECEIVED BY:		DATE/TIME	
RECEIVED BY: Alan Morris		DATE/TIME 6/30/90 930		RECEIVED BY:		DATE/TIME	
REMARKS See Herb Keller, also attached to P&DP...		SAMPLE SHIPPED VIA UPS		HAND		OTHER	
		AIR BILL# 5600092470		ENTERED AT		COC	

110000



July 12, 1990

SED28178:LA

*Received
7/17/90
oro*

Mr. James Moore
CH2M HILL/ORO
599 Oak Ridge Turnpike
Oak Ridge, TN 37830

RE: Analytical Data for Paducah Gaseous Diffusion Plant, Laboratory No. 16274

Dear Mr. Moore:

On July 2, 1990, the CH2M Hill Montgomery Laboratory received ten samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. No unusual difficulties were encountered during the analysis of these samples.

If you should have any questions concerning the data, please inquire.

Sincerely,

Ward Dickens
Organics Division Manager

Enclosures

cc: Mr. Craig Vinson

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SBO 825 (LMG #16274005)	5
SB550 825 (LMG #16274006)	6
SBFRO 825 (LMG #16274007)	7
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ANALYTICAL METHODOLOGY

Organic Analysis

Priority Pollutants: Water, soil and waste samples are analyzed in accordance with procedures described in Methods 608, 624, and 625, EPA-600/4-82-057 (1982); Methods 8080, 8240, and 8270, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition; and methods outlined in the USEPA Contract Laboratory Program Statement of Work for Organics Analysis, February, 1988.

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Organophosphate Pesticides: Samples are analyzed in accordance with procedures described in Methods 614 and 622, EPA-600/4-79-019 (1979) and in Method 8140, Test Methods for Evaluating Solid Waste, 1986, SW-846, Third Edition.

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Trihalomethanes: Water samples are analyzed with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

EPA - DEFINED QUALIFIERS

ORGANICS

Definitions for the EPA-defined qualifiers:

- U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the quantitation limit for that compound. The detection limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.
- J -- Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound below the stated PQL. The "J" qualifier is not used with pesticide results.
- C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E -- This flag applies to GC/MS only. The "E" qualifier indicates a compound may be above or below the linear range of the instrument. If the particular compound level is deemed above the linear calibration range, then the sample should be reanalyzed at an appropriate dilution. Therefore, the "E" qualified amount is an estimated concentration. The results for the dilution will be reported on a separate Form I and will be flagged with a "D" if the dilution brings the concentration within proper calibration.
- D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.
- A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.
- X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.
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CLIENT SAMPLE ID QUALIFIERS

LEVEL 1

The qualifiers that GC/MS uses with the client sample ID are defined below:

- DL -- Dilution Run
- R -- Rerun (may be followed by a digit to indicate multiple reruns)
- RD -- Diluted Rerun
- RX -- Re-extraction Analysis
- MS -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)
- MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)
- QC_BLANK -- Method Blank (may be followed by an S for soils run at a low level, W for waters, or SM for soils run at a medium level) (letters may be followed by a digit to indicate multiple blanks of that type; if there are no letters the digit indicates multiple blanks).

These qualifiers allow GC/MS to have unique client sample ID's so that the client can get more accurate information from the data reported.

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 16274

CH2M HILL

Sample No.

Sample Description

16274001	SAMPLE SB750, 75	06/30/90	0747
16274002	SAMPLE SB1500, 75	06/30/90	0752
16274003	SAMPLE SB2250, 0	06/30/90	0843
16274004	SAMPLE SBEQBLK04	06/30/90	0847
16274005	SAMPLE SB0, 825	06/30/90	0958
16274006	SAMPLE SB550, 825	06/30/90	1003
16274007	SAMPLE SBFRO, 825	06/30/90	1012
16274008	SAMPLE SB0, 3000	06/30/90	1108
16274009	SAMPLE SB-2250, 2300	06/30/90	1349
16274010	SAMPLE SB-1500, 2350	06/30/90	1357



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274001
Client Sample ID: SB750 75

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	101			
	1,4-Bromofluorobenzene - SS	99			
	1,2-Dichloroethane-d4 - SS	112			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274002
Client Sample ID: SB1500 75

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	103			
	1,4-Bromofluorobenzene - SS	98			
	1,2-Dichloroethane-d4 - SS	109			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274003
Client Sample ID: SB2250 0

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	99			
	1,4-Bromofluorobenzene - SS	98			
	1,2-Dichloroethane-d4 - SS	103			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274004
Client Sample ID: SBEQBLK04

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	104		
	1,4-Bromofluorobenzene - SS	96		
	1,2-Dichloroethane-d4 - SS	103		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16274005
 Client Sample ID: SBO 825

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 07/02/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	37			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	100			
	1,4-Bromofluorobenzene - SS	95			
	1,2-Dichloroethane-d4 - SS	109			

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$TCE = \left[\frac{\frac{37}{25} \times 24.5}{131.40} \right] \text{ ppm}$$

$$TCE = 0.28 \text{ ppm}$$

msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274006
Client Sample ID: SB550 825

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) .	ND			
	Dichloroethanes (TOTAL) .	ND			

	Toluene-d8 - SS	104			
	1,4-Bromofluorobenzene - SS	95			
	1,2-Dichloroethane-d4 - SS	120			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274007
Client Sample ID: SBFRO 825

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	35		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	105		
	1,4-Bromofluorobenzene - SS	97		
	1,2-Dichloroethane-d4 - SS	112		

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

$$TCE = \left[\frac{\frac{35}{25} \times 24.5}{131.40} \right] \text{ppm}$$

$$TCE = 0.26 \text{ ppm}$$

Handwritten signature



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274008
Client Sample ID: SBO 3000

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	26			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	104			
	1,4-Bromofluorobenzene - SS	95			
	1,2-Dichloroethane-d4 - SS	106			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{26}{25} \times 24.5}{133.42} \right] \text{ppm}$$

$$1,1,1\text{-TCA} = 0.20 \text{ ppm}$$

000008



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16274009
Client Sample ID: SB2250 2300

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	101			
	1,4-Bromofluorobenzene - SS	97			
	1,2-Dichloroethane-d4 - SS	94			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16274010
 Client Sample ID: SB-1500 2350

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 07/02/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	37			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	106			
	1,4-Bromofluorobenzene - SS	94			
	1,2-Dichloroethane-d4 - SS	106			

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{37}{25} \times 24.5}{133.42} \right] \text{ ppm}$$

$$1,1,1\text{-TCA} = 0.27 \text{ ppm}$$

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: T07020B1
Client Sample ID: QC BLANK A

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/02/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	102			
	1,4-Bromofluorobenzene - SS	96			
	1,2-Dichloroethane-d4 - SS	95			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

CHAM HILL QUALITY ANALYTICS
 CHAIN OF CUSTODY RECORD

PROJECT NUMBER: **SED28178-FG 05**
 PROJECT NAME: **CH2M Hill PGDP**
 CLIENT NAME: **CH2M Hill**

PROJECT MANAGER: **Jim Moore**
 COPY TO: **Sample Manager**
 REQUESTED COMP. DATE: **4/8/90**

STA NO.	DATE	TIME	SAMPLE DESCRIPTIONS (12 CHARACTERS)	COMPARISON		
				S	O	L
	4/30	0747	SB 750, 75			
		0752	SB 1500, 75			
		0843	SB 2250, 10			
		0847	SB EQBLK 04			
		0958	SB 0, 825			
		1003	SB 550, 825			
		1012	SB FR 0, 825			
		1108	SB 0, 3000			
		1249	SB -2250, 3000			
		1357	SB -1500, 2350			

SAMPLED BY AND TIME: **Herb Kelly 4/30/90 14:30**
 RECEIVED BY: **[Signature]**
 RECEIVED BY: **[Signature]**
 RECEIVED BY: **[Signature]**
 RECEIVED BY: **[Signature]**

CLIENT ADDRESS AND PHONE NUMBER: **CH2M Hill 800 Oak Ridge Turnpike, Suite 102 Oak Ridge, TN 37830 (615)483-9032**

* OF CONTAINERS

ANALYSES REQUESTED	DATE/TIME	RELINQUISHED BY
VOC, TCE	6-30-90 14:45	[Signature]

LAB# **16274**
 LAB# **SED28178.LA**
 PROJECT NO. **8273/90**
 QUOTE# **VERIFIED 7/13/90**

NO. OF SAMP **PG OF**
 BS

REMARKS

001	HMK	0.1	P/M
002		0.0	
003		0.0	
004		0.0	
005		0.2	
006		0.0	
007		0.2	
008		0.0	
009		0.0	
010		0.0	

HAZWRAP/NEESA **Y (N)**
 QC LEVEL **2, 3**
 COC **take**
 ICE **NO**
 ANA. REQ. **ATM**
 CUSTISEAL **PH**
 SAMPLE COND. **AN/GOOD**

AIR BILL# **560092492**
 ENTERED INTO LIMS **[Signature]**
 COC REVIEWED **[Signature]**
 11771125



July 12, 1990

SED28178.LA

Received
7/17/90
ORO

Mr. James Moore
CH2M HILL/ORO
599 Oak Ridge Turnpike
Oak Ridge, TN 37830

RE: Analytical Data for Paducah Gaseous Diffusion Plant, Laboratory No. 16284

Dear Mr. Moore:

On July 3, 1990, the CH2M Hill Montgomery Laboratory received seventeen samples with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Sample SBO, 2250 (LMG #16284004) was received with no volume in the Tedlar bag. Therefore, no analysis could be performed on this sample. No other difficulties were encountered during the analysis of these samples.

If you should have any questions concerning the data, please inquire.

Sincerely,

Ward Dickens
Organics Division Manager

Enclosures

cc: Mr. Craig Vinson

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CH2M HILL Laboratory No. 16284

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SBO 1675 (LMG #16284003)	3
SB3000 1500 (LMG #16284005)	4
SBEQBLK05 (LMG #16284006)	5
SB3550 3000 (LMG #16284007)	6
SB-3750 2250 (LMG #16284008)	7
SBFR3750 2250 (LMG #16284009)	8
SB3250 3750 (LMG #16284010)	9
SB2950 4500 (LMG #16284011)	10
SB2250 6000 (LMG #16284012)	11
SB750 6000 (LMG #16284013)	12
SB750 3750 (LMG #16284014)	13
SB750 4500 (LMG #16284015)	14
SB750 3000 (LMG #16284016)	15
SBO 3000 (LMG #16284017)	16
 Quality Control Data	
Results of Method Blank (T07030B1)	17
 Copy of Chain-of-custody	 18-19

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Trihalomethanes: Water samples are analyzed with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

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- C -- This flag applies to pesticide results only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
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- D -- This flag identifies compounds which have been run at a dilution to bring the concentration of that compound within the linear range of the instrument. "D" qualifiers are only used for samples that have been run initially with results above acceptable ranges. For secondary dilutions the "DL" suffix is appended to the sample number on the Form I.
- A -- Indicates the Tentatively Identified Compound (TIC) is a suspected aldol-condensation product.
- X -- Indicates the compound concentration has been manually modified or the EPA qualifier has been manually modified or added.
- JX -- This value is less than the sample quantitation limit that would have been displayed for "U".

CLIENT SAMPLE ID QUALIFIERS

LEVEL 1

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- RD** -- Diluted Rerun
- RX** -- Re-extraction Analysis
- MS** -- Matrix Spike (may be followed by a digit to indicate multiple matrix spikes within a sample set)
- MSD** -- Matrix Spike Duplicate (may be followed by a digit to indicate multiple matrix spike duplicates within a sample set)
- QC_BLANK** -- Method Blank (may be followed by an S for soils run at a low level, W for waters, or SM for soils run at a medium level) (letters may be followed by a digit to indicate multiple blanks of that type; if there are no letters the digit indicates multiple blanks).

These qualifiers allow GC/MS to have unique client sample ID's so that the client can get more accurate information from the data reported.

TABLE 1

SAMPLE CROSS-REFERENCE SUMMARY

CH2M HILL Laboratory No. 16284

<u>CH2M HILL Sample No.</u>	<u>Sample Description</u>		
16284001	SAMPLE SB-750, 865	07/01/90	0816
16284002	SAMPLE SB-750, 1500	07/01/90	0824
16284003	SAMPLE SB0, 1675	07/01/90	0924
16284004	SAMPLE SB0, 2250	07/01/90	0935
16284005	SAMPLE SB3000, 1500	07/01/90	1035
16284006	SAMPLE SBEQBLK05	07/01/90	1038
16284007	SAMPLE SB-3550, 3000	07/01/90	1140
16284008	SAMPLE SB-3750, 2250	07/01/90	1148
16284009	SAMPLE SBFR-3750, 2250	07/01/90	1219
16284010	SAMPLE SB-3250, 3750	07/01/90	1233
16284011	SAMPLE SB-2950, 4500	07/02/90	0742
16284012	SAMPLE SB-2250, 6000	07/02/90	0754
16284013	SAMPLE SB750, 6000	07/02/90	0907
16284014	SAMPLE SB750, 3750	07/02/90	0918
16284015	SAMPLE SB750, 4500	07/02/90	1007
16284016	SAMPLE SB750, 3000	07/02/90	1028
16284017	SAMPLE SB0, 3000	07/02/90	1125



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284001
Client Sample ID: SB750 865

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	100			
	1,4-Bromofluorobenzene - SS	91			
	1,2-Dichloroethane-d4 - SS	103			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

Msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284002
Client Sample ID: SB750 1500

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	98			
	1,4-Bromofluorobenzene - SS	89			
	1,2-Dichloroethane-d4 - SS	106			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284003
Client Sample ID: SBG 1675

Concentration: LOW
Sample Matrix: AIR
Percent Moisture:

Date Extracted:
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	99			
	1,4-Bromofluorobenzene - SS	88			
	1,2-Dichloroethane-d4 - SS	111			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

Msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284005
Client Sample ID: S83000 I500

Concentration: LOW
Sample Matrix: AIR
Percent Moisture:

Date Extracted:
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	99			
	1,4-Bromofluorobenzene - SS	89			
	1,2-Dichloroethane-d4 - SS	114			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284006
Client Sample ID: SBEQBLK05

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND		
71-55-6	1,1,1-Trichloroethane	ND		
79-01-6	Trichloroethene	ND		
	Dichloroethenes (TOTAL)	ND		
	Dichloroethanes (TOTAL)	ND		

	Toluene-d8 - SS	103		
	1,4-Bromofluorobenzene - SS	90		
	1,2-Dichloroethane-d4 - SS	104		

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284007
Client Sample ID: SB3550 3000

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	97			
	1,4-Bromofluorobenzene - SS	91			
	1,2-Dichloroethane-d4 - SS	114			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

000006



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
 Lab Sample ID: 16284008
 Client Sample ID: SB-3750 2250

Concentration: LOW
 Sample Matrix: AIR
 Percent Moisture: _____

Date Extracted: _____
 Date Analyzed: 07/03/90
 Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number	ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND	
71-55-6	1,1,1-Trichloroethane . . .	26	
79-01-6	Trichloroethene	ND	
	Dichloroethenes (TOTAL) . .	ND	
	Dichloroethanes (TOTAL) . .	ND	

	Toluene-d8 - SS	100	
	1,4-Bromofluorobenzene - SS	90	
	1,2-Dichloroethane-d4 - SS	124	

ND - Compound analyzed for but not detected.
 B - Compound was detected in QC blank.
 SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{26}{25} \times 24.5}{133.42} \right] \text{ ppm}$$

$$1,1,1\text{-TCA} = 0.20 \text{ ppm}$$

MSE



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284009
Client Sample ID: SBER3750 2250

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number	ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND	
71-55-6	1,1,1-Trichloroethane . . .	31	
79-01-6	Trichloroethene	ND	
	Dichloroethenes (TOTAL) . .	ND	
	Dichloroethanes (TOTAL) . .	ND	

	Toluene-d8 - SS	100	
	1,4-Bromofluorobenzene - SS	89	
	1,2-Dichloroethane-d4 - SS	101	

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

$$1,1,1\text{-TCA} = \left[\frac{\frac{31}{25} \times 24.5}{133.42} \right] \text{ppm}$$

$$1,1,1\text{-TCA} = 0.23 \text{ ppm}$$

Msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284010
Client Sample ID: SB3250 3750

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	98			
	1,4-Bromofluorobenzene - SS	92			
	1,2-Dichloroethane-d4 - SS	105			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

000009



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284011
Client Sample ID: SB2950 4500

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	95			
	1,4-Bromofluorobenzene - SS	87			
	1,2-Dichloroethane-d4 - SS	122			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

Msc



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284012
Client Sample ID: SB2250 6000

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	101			
	1,4-Bromofluorobenzene - SS	86			
	1,2-Dichloroethane-d4 - SS	122			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284013
Client Sample ID: SB750 6000

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number	ng	CAS Number	ng
75-01-4	Vinyl Chloride	ND	
71-55-6	1,1,1-Trichloroethane	ND	
79-01-6	Trichloroethene	ND	
	Dichloroethenes (TOTAL)	ND	
	Dichloroethanes (TOTAL)	ND	

	Toluene-d8 - SS	105	
	1,4-Bromofluorobenzene - SS	86	
	1,2-Dichloroethane-d4 - SS	107	

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284014
Client Sample ID: SB750 3750

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	102			
	1,4-Bromofluorobenzene - SS	90			
	1,2-Dichloroethane-d4 - SS	104			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284015
Client Sample ID: SB750 4500

Concentration: LOW
Sample Matrix: AIR
Percent Moisture:

Date Extracted:
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	100			
	1,4-Bromofluorobenzene - SS	90			
	1,2-Dichloroethane-d4 - SS	101			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284016
Client Sample ID: SB750 3000

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL)	ND			
	Dichloroethanes (TOTAL)	ND			

	Toluene-d8 - SS	92			
	1,4-Bromofluorobenzene - SS	92			
	1,2-Dichloroethane-d4 - SS	121			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 16284017
Client Sample ID: SBO 3000

Concentration: LOW
Sample Matrix: AIR
Percent Moisture: _____

Date Extracted: _____
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	98			
	1,4-Bromofluorobenzene - SS	93			
	1,2-Dichloroethane-d4 - SS	109			

- ND - Compound analyzed for but not detected.
- B - Compound was detected in QC blank.
- SS - Surrogate Standard reported as percent recovery.

Form I

MSC



ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/MGM
Lab Sample ID: 107030B1
Client Sample ID: QC-BLANK A

Concentration: LOW
Sample Matrix: AIR
Percent Moisture:

Date Extracted:
Date Analyzed: 07/03/90
Dilution Factor: 1.0

VOLATILE COMPOUNDS (TEDLAR BAGS)

CAS Number		ng	CAS Number		ng
75-01-4	Vinyl Chloride	ND			
71-55-6	1,1,1-Trichloroethane . . .	ND			
79-01-6	Trichloroethene	ND			
	Dichloroethenes (TOTAL) . .	ND			
	Dichloroethanes (TOTAL) . .	ND			

	Toluene-d8 - SS	96			
	1,4-Bromofluorobenzene - SS	94			
	1,2-Dichloroethane-d4 - SS	111			

ND - Compound analyzed for but not detected.
B - Compound was detected in QC blank.
SS - Surrogate Standard reported as percent recovery.

Form I