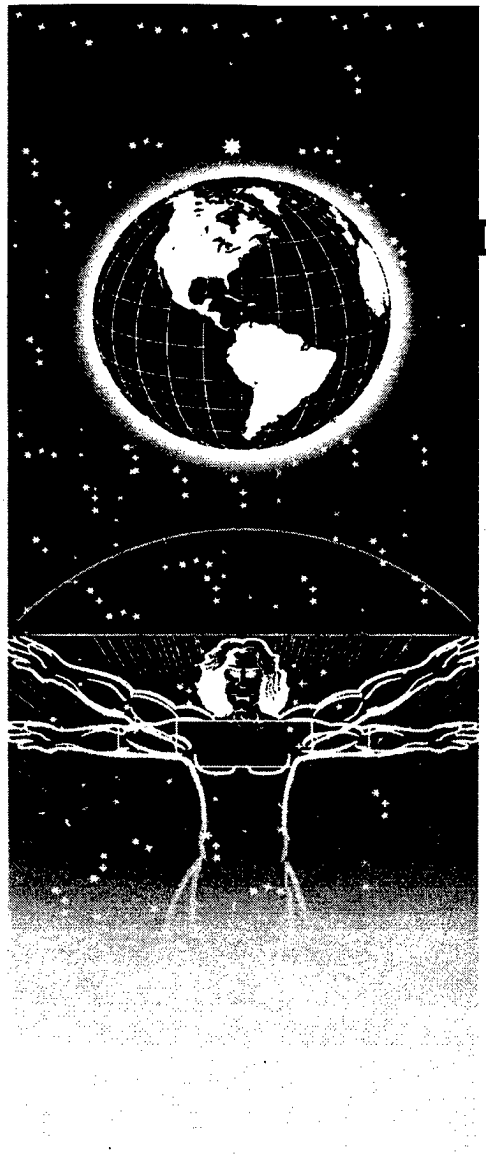
AL/EQ-TR-1996-0040



UNITED STATES AIR FORCE ARMSTRONG LABORATORY

Demonstration of Radio-Frequency Soil Decontamination: KAI Technologies Demonstration (Volume III of III) Part 2: Pages 230-360

Gilbert B. Avila, David L. Faust, Raymond S. Kasevich, and Steven L. Price

KAI Technologies, Inc.
Eastern Office and Laboratory
170 West Road, Suite 7
Portsmouth, New Hampshire, 03801

December 1996

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Environics Directorate
Environmental Risk Management Division
139 Barnes Drive
Tyndall Air Force Base FL
32403-5323

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This report has been reviewed and is approved for publication.

JEFFREY A. STINSON, Capt, USAF, BSC
Project Officer

ALLAN M. WEINER, Lt Col, USAF
Chief, Site Remediation Division

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13. Supplementary Notes

14. Abstract The Air Force Armstrong Laboratory, Tyndall Air Force Base, Florida, has supported the research and development of Radio Frequency Soil Decontamination. Radio frequency soil decontamination is essentially a heat-assisted soil vapor extraction process. Site S-1 at Kelly Air Force Base, Texas, was selected for the demonstration of two patented techniques. The site is a former sump that collected spills and surface runoff from a waste petroleum, oils, and lubricants and solvent storage and transfer area. In 1993, a technique developed by the ITT Research Institute using an array of electrodes placed in the soil was demonstrated. In 1994, a technique developed by KAI Technologies, Inc. using a single applicator placed in a vertical borehole was demonstrated. Approximately 120 tons of soil were heated during each demonstration to a temperature of about 150 degrees Celsius.

15. Subject Terms Radio Frequency Soil Heating, Soil Vapor Extraction

Security Classification of			19. Limitation of Abstract	20. # of Pages	21. Responsible Person (Name and Telephone #)
16. Report classified	17. Abstract Unclassified	18. This Page Unclassified	Unlimited	513	Capt Jeffrey A. Stinson (904) 283-6254

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PREFACE

This report was prepared by Halliburton NUS Environmental Corporation, 800 Oak Ridge Turnpike, Oak Ridge, TN 37830 under contract F33615-90-D-4011 for the Armstrong Laboratory Environics Directorate (AL/EQW) (formerly the Air Force Engineering and Services Center), Tyndall AFB, FL 32403-5323.

This final report summarizes the project's Phase I efforts for a field demonstration of the IIT Research Institute's (IITRI) tri-plate capacitor and the KAI Technologies, Inc.'s (KAI) antenna radio frequency heating (RFH) techniques for the enhancement of soil vapor extraction (SVE) for the in situ decontamination of soils.

The work was performed between June 1992 and December 1994. The AL/EQW technical project officers were Mr. Paul F. Carpenter (during the initial stage of the project) and Capt Jeffrey A. Stinson (during the latter stage of the project).

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EXECUTIVE SUMMARY

The United States Air Force developed the Installation Restoration Program to assess past hazardous waste disposal and spill sites and prepare remedial actions consistent with the National Contingency Plan for those sites that pose a threat to human health or the environment. Within that program the Site Remediation Division of the Environics Directorate of the Air Force's Armstrong Laboratory at Tyndall AFB, Florida, has supported the research and development of Radio Frequency Soil Decontamination.

Armstrong Laboratory was sufficiently encouraged by the early test results in sandy soils at Tyndall AFB, Florida, and Volk Field, Wisconsin, to pursue larger-scale demonstrations in tight soils that are more difficult to treat. In September 1991, the Air Force Center for Environmental Excellence at Brooks AFB, Texas, contracted Halliburton NUS Environmental Corporation (now Brown & Root Environmental) to conduct pilot scale demonstrations of two different, patented, radio frequency heating techniques at Site S-1 at Kelly AFB, Texas.

The project was divided into three phases the Preplanning Phase, Phase I, and Phase II. The Preplanning Phase, completed in September 1992, included literature review, conceptual cost estimations, design plans and specifications preparation and review, and publication of a final report documenting the results. Phase I included two integrated pilot tests and the preparation of this final technical report evaluating the results of Phase I and the conceptual planning of Phase II. Phase II will include the complete planning and design of a full-scale commercial demonstration of radio frequency soil decontamination.

Radio frequency soil decontamination is essentially a heat-assisted vapor extraction process. Radio frequency energy applied to the soil causes polar molecules, including water and many organic compounds, to vibrate. This vibrational energy is lost as heat. The resulting rise in soil temperature vaporizes both water and contaminants, which may then be removed by application of a vacuum. Extracted vapors may be treated by a variety of methods, depending on the site and the nature of the contaminants. Vapors extracted during the demonstrations at Site S-1 were burned in a flare.

Two types of radio frequency soil heating were demonstrated at Site S-1 from January to August 1993 and 1994. In 1993, a technique developed by the IIT Research Institute that uses a series of exciter and ground electrodes placed in the soil was demonstrated. This technique was tested previously at Air Force sites. In 1994, a technique developed by KAI Technologies, Inc. which uses

an antenna-like device that may be placed in a vertical or horizontal borehole was demonstrated. Halliburton NUS Environmental Corporation provided site preparation services, the vapor extraction system, and supervised and coordinated all other aspects of the demonstrations.

Armstrong Laboratory, Kelly AFB, and the US Department of Energy have contributed funds and guidance for the work completed to date which includes the Preplanning Phase and Phase I. In addition, the Phase I demonstrations are part of the US Environmental Protection Agency's Superfund Innovative Technology Evaluation Program.

Halliburton NUS Environmental Corporation concludes that data gathered during the pilot demonstrations is invaluable to the development of radio frequency heating for the enhancement of soil vapor extraction and can be used to design a commercial scale system and implement remedial activities in accordance with United States Air Force procedures. From lessons learned during the Site S-1 demonstrations, criteria for technology implementation have become apparent that allow the selection of a site better suited to the unique physical and chemical phenomenon inherent in the process. To date only six field tests have been completed. These tests have addressed situations with a wide variance of soil and contaminant characteristics. A phased approach is recommended which would include more demonstrations to plug data gaps and define unknowns followed by commercial scale application. A smaller site with a simpler (more homogenous) soil and contaminant matrix, relative to Site S-1, would simplify the evaluation of results and better define technology applicability.

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HALLIBURTON NUS
Environmental Corporation

APPENDIX K

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT	BORING NO.
RF Heating	F3
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow stem auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 23	
TIME STARTED 1215	DATE 1/15/94
TIME COMPLETED 1306	DATE 1/15/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED. TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, upper 60°F, moderate east wind	
SURFACE ELEVATION	
COMMENTS: Gravel	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	OVA	LITHOLOGIC CODE	DEPTH (FEET)
									1
									2
									3
									4
3" SP	2.0	1.5	Good	KRF-F3 1221	10406	0			5
									6
									7
									8
									9

4-6' Clay, slightly silty, w/ gravel, concrete frag, dry to sl. moist, FILL

#2 liner - regular

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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT	BORING NO.
RF Testing	F2
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼" ID	
DRILLERS NAME: John Fallon	
TOTAL DEPTH (FT.): 27.5	
TIME STARTED 0958	DATE 1/15/94
TIME COMPLETED 1110	DATE 1/15/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, lo 60°F; light east wind	
SURFACE ELEVATION	
COMMENTS: Gravel	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F1
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 23'	
TIME STARTED: 0814	DATE: 1/15/94
TIME COMPLETED: 0937	DATE: 1/15/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Wet	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly cloudy, upper 30°SF, slight NW wind	
SURFACE ELEVATION	
COMMENTS	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	OVA	LITHOLOGIC CODE	DEPTH (FEET)
									1
									2
									3
									4
SP	1.5	0.7	Good	MRF-F1-010406 0822	4				5
									6
									7
									8
									9
									10

3" SS

4.5.5' Clay, silty, w/ gravel, wood frags, dk brn, wet, FILL

#1 liner - rejected

75 blows for 1.5' driven, driller reports on rock

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Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E8
JOB NO.: 3688	LOGGED BY: GDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼"	
DRILLERS NAME: John Fulbot	
TOTAL DEPTH (FT.): 28'	
TIME STARTED: 0925	DATE: 1/18/94
TIME COMPLETED: 1051	DATE: 1/18/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Wet, water at ~25'	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, lo 40°F, strong NE wind, gusty	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
3" SP	2.0	1.6	Good	KRF-E8-10608	2	0935		7
								8
								9
								10

COMMENTS

6-8' Clay, silty, w/ gravel, dk brn, sl. moist, FILL

#2 liner - sampler

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET: 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E7
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 14	
TIME STARTED: 1600	DATE: 1/13/94
TIME COMPLETED: 1645	DATE: 1/13/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, upper 60's, NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
3" SP	2.0	1.6	Good	RF-E7-40204		32 1604		3
								4
								5
								6
								7
								8
								9

COMMENTS

Gravel at surface.

2'-4' Clay, silty, w/ gravel, lighter brn to red brn, moist

#2 liner - regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT	BORING NO. E6
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 22	
TIME STARTED 1350	DATE 1/14/94
TIME COMPLETED 1443	DATE 1/14/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING Dry	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS Fair, upper 60°F, mod. SW wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	Gravel
								2	
								3	
								4	
								5	
								6	
								7	
								8	
3" SP	2.0	1.9	Good	KRF-E6-040810 1358	2		235	9	Clay, silty, sdy, w/ gravel, dk brn, moist, FILL
								10	

#2 liner - regular

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FIELD LOG OF BORING

SHEET: 1 OF 2

PLAN

PROJECT	BORING NO.
RF Heating	E5
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼"	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 22	
TIME STARTED 1355	DATE 1/17/94
TIME COMPLETED 1523	DATE 1/17/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, upper 50°F, strong NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	
								2	
								3	
								4	
3" SP	2.0	1.7	Good		1404	4		5	4'-6' Clay, sandy, silty, w/ gravel, med. brn to dk brn, dry, filter fabric, wire FILL
								6	#2 liner - regular
3" SP	2.0	1.2	Good		1408	14		7	6'-8' Same as 4'-6'
								8	
								9	#2 liner - regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E4
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 26'	
TIME STARTED 1006	DATE 1/17/94
TIME COMPLETED 1208	DATE 1/17/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, lo 50°F, strong 15-20mph N win	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
3" SP	2.0	0.3	Poor		1033	0		7
3" SP	2.0	2.0	Good	KRF-E4406709	~~1035~~ 1055	~~0~~ 32		8
								9

COMMENTS

Gravel at sfc

3' Large gravel or concrete

6-7' On hard obstruction, cannot drive split spoon, use wedge and downhole hammer to break through obstruction, no sample due to poor recovery

7-9' clay, w/ sand, gravel, red. br., slight hydrocarbon odor

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E3
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 29.0	
TIME STARTED: 1542	DATE: 1/17/94
TIME COMPLETED: 1754	DATE: 1/17/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Wet	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, mid 60°F, strong NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9

COMMENTS

Gravel at sfc.

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E2
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼"	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 28.0	
TIME STARTED 1228	DATE 1/18/94
TIME COMPLETED 1402	DATE 1/18/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	OVA	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.0	Fair	KRF-E2-40002	1233	8			1
									2
									3
									4
									5
									6
									7
									8
									9
									10

COMMENTS

0 - 0.3' Gravel, silty, light brn
0.3' - 2.0' Silt, clayey, w/ gravel, 2" chunk of asphalt in shoe, dk brn, dry, FILL
#1 liner - regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E1
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 24.6	
TIME STARTED: 0804	DATE: 1/14/94
TIME COMPLETED: 1100	DATE: 1/14/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Fair, upper 30°s F, slight breeze	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN ~~OVA~~ (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	2.0	Good		HNF-E1-40002	HNU 1100? 0816		1 2 3 4 5 6 7 8 9

COMMENTS

0'-0.4' Gravel at surface
0.4'-2.0' Silt, clayey, sl/ gravel, red brn to dk brn, FG stained, dry
#2 liner regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET: 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: A2
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 6¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 27.2'	
TIME STARTED: 1009	DATE: 1/12/94
TIME COMPLETED: 1225	DATE: 1/12/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Overcast, upper 50s°F, NE wind - moderate	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.5	Good		KAF-A2-40002 1015	5		1
3" SP	2.0	1.5	Good		KAF-A2-40004 1022	0		3
3" SP	2.0	0.9	Good		KAF-A2-40006 1033	0		5
								7
								9

COMMENTS

0'-0.5' Gravel fill

0.5'-2.0' Fill, Silt, clayey, w/ gravel, yellowish brn to med. brn, dry
#2 liner - regular

2'-4' Silt, clayey, plastic, wire, w/ gravel, FILL, #2 liner - regular

4'-6' Clay, silty, w/ gravel, upper wire, metal, wood, med. brn, moist.
#2 liner - regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: A1
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 28'	
TIME STARTED 1630	DATE 1/11/94
TIME COMPLETED 1845	DATE 1/11/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly cloudy, mid 60's, mod. wind in	
SURFACE ELEVATION	

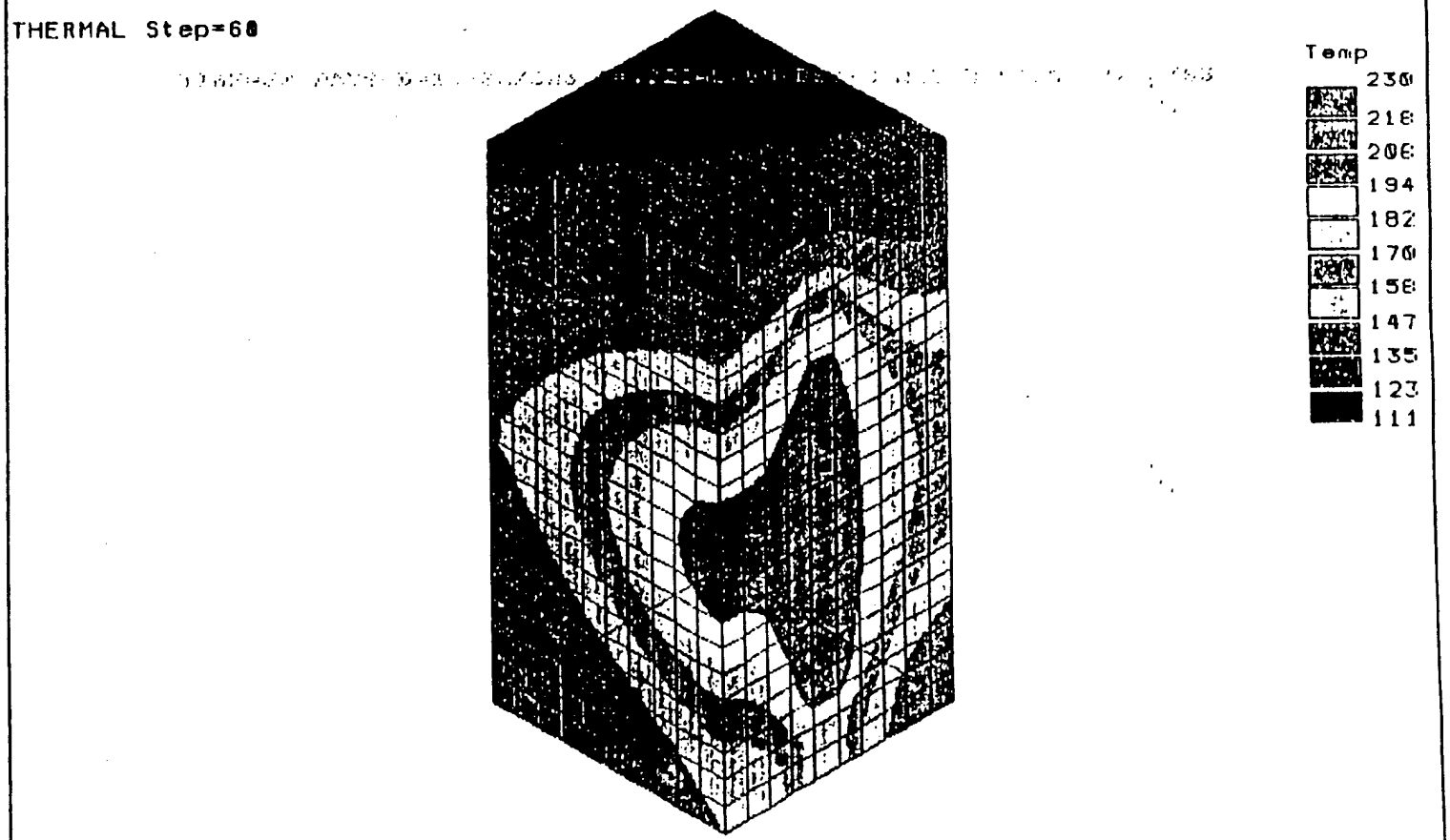
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2	1.1	Good		KAF-A1-U0002 1645	0		1
								2
								3
								4
								5
								6
								7
								8
								9

COMMENTS

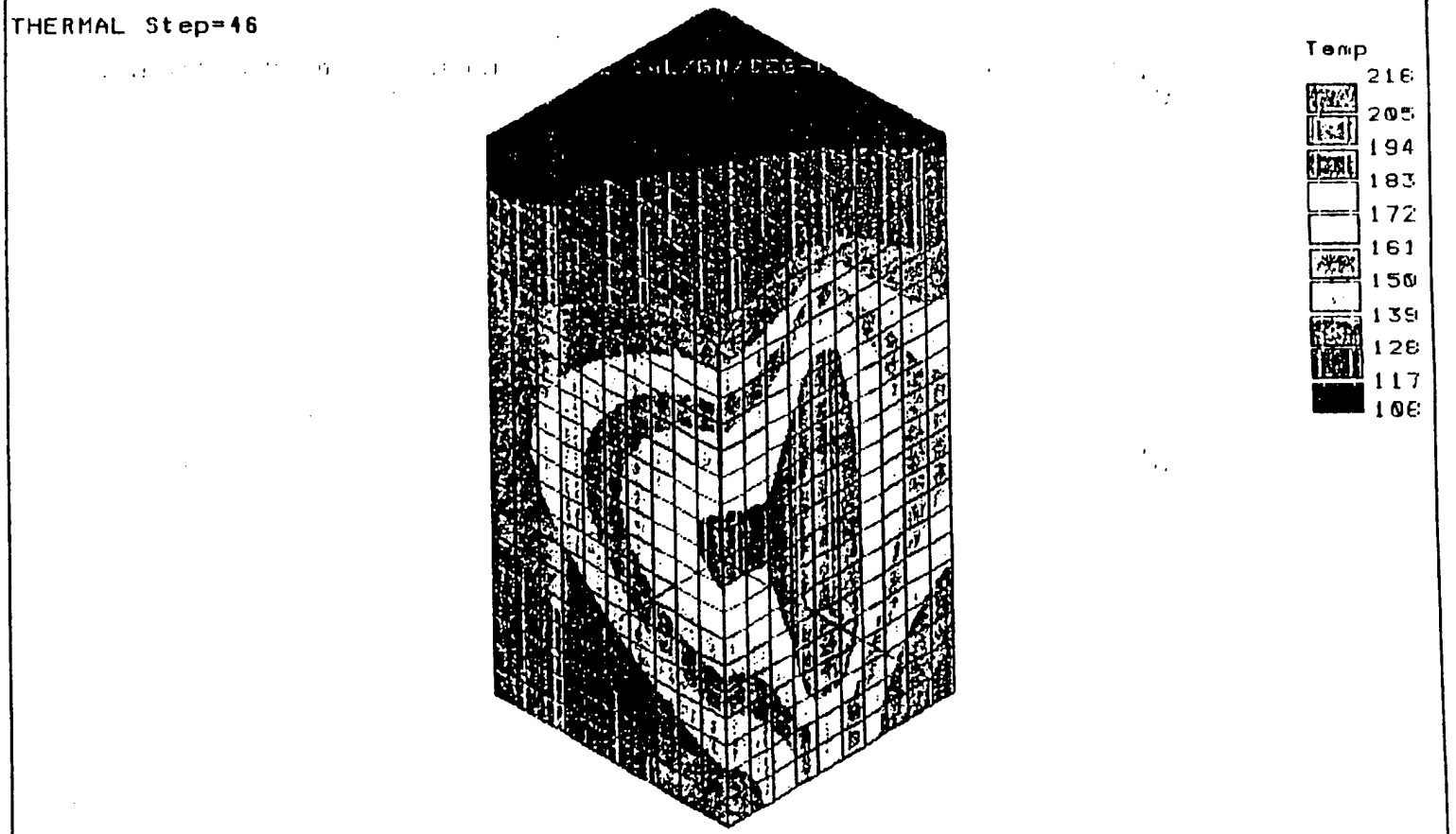
Gravel @ sfc

Fill: clay, gravelly, dark brn, dry

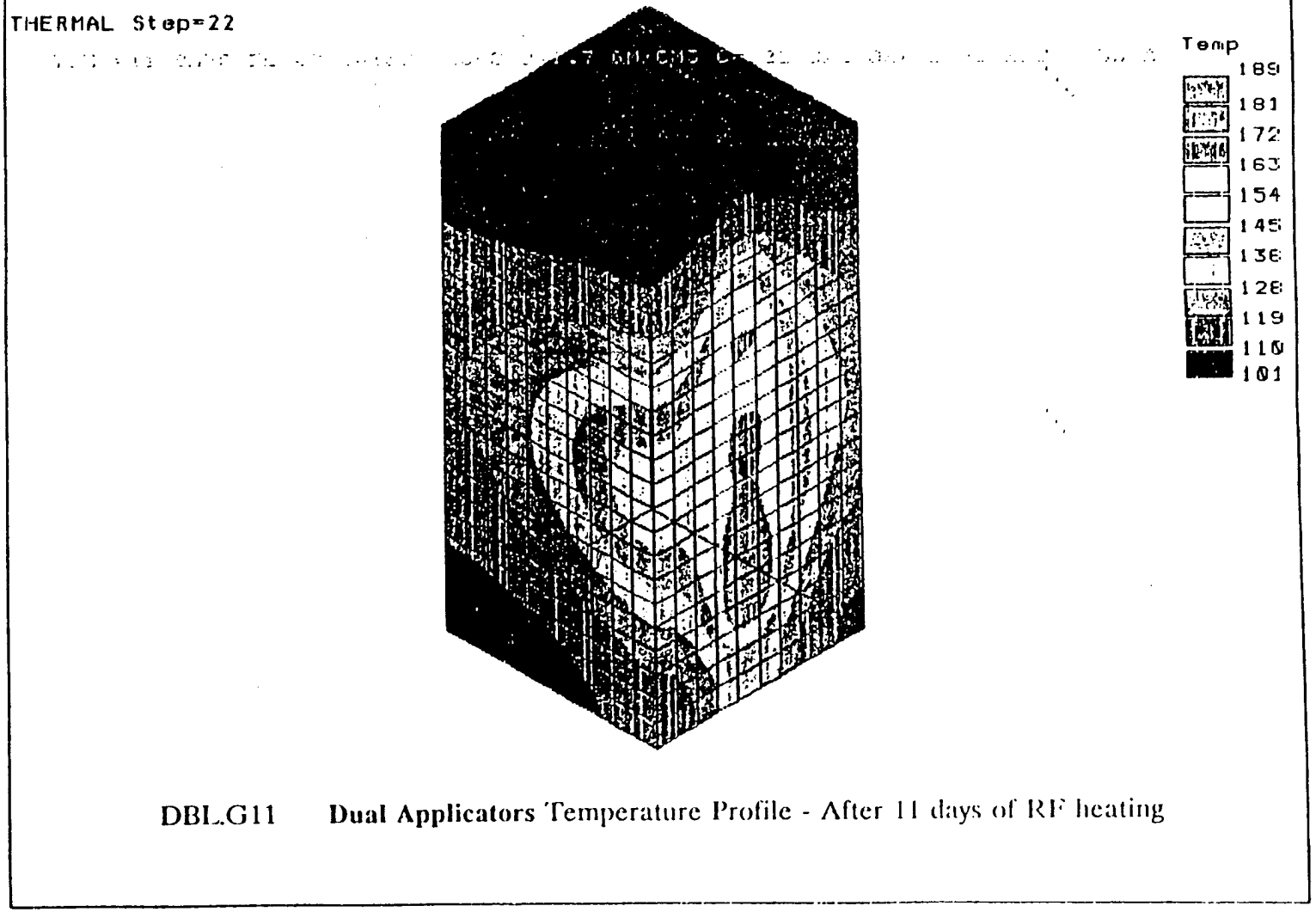
#1 liner for analysis



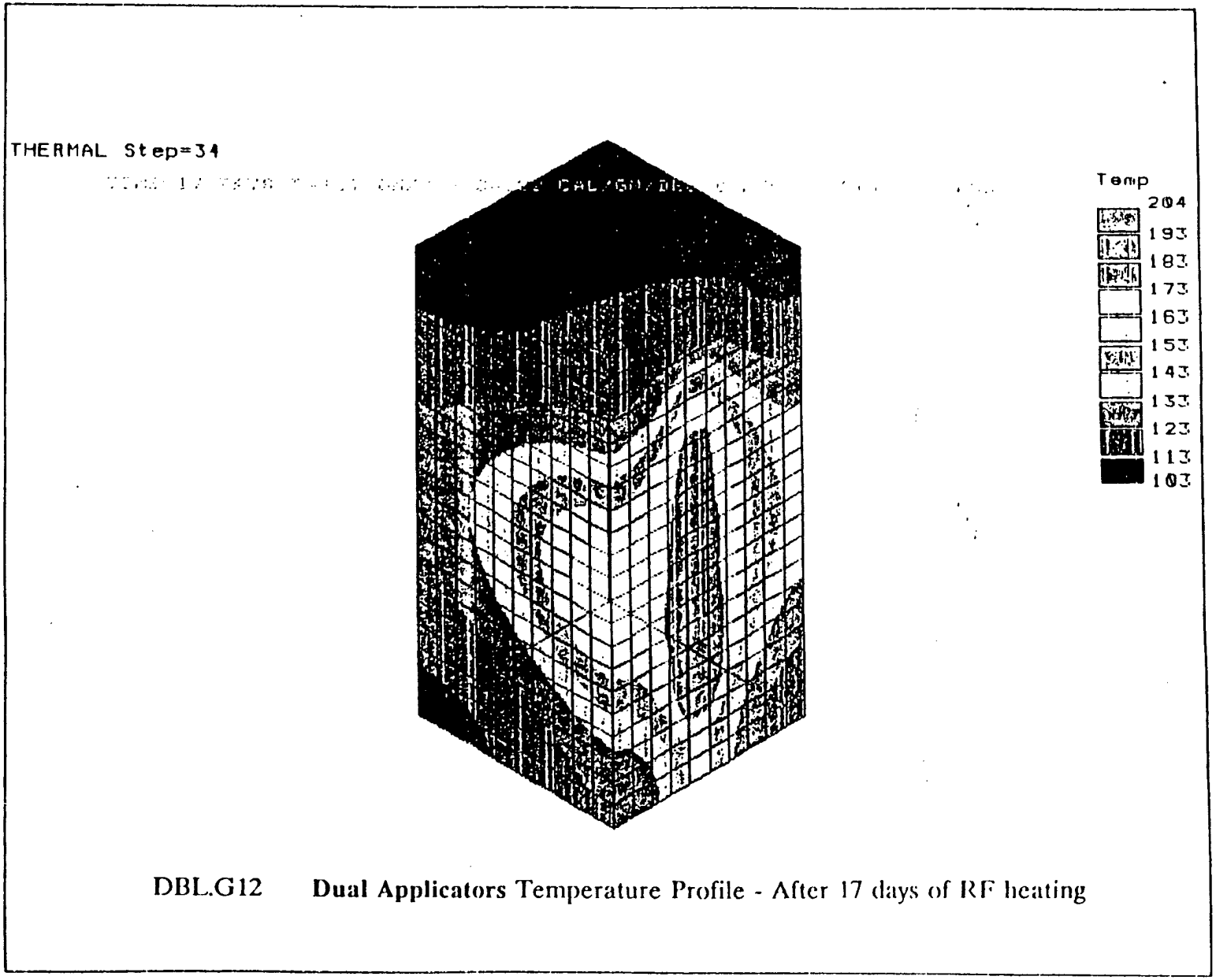
DBL.G15 **Dual Applicators** Temperature Profile - After 30 days of RF heating



DBL.G13 **Dual Applicators** Temperature Profile - After 23 days of RF heating



DBL.G11 **Dual Applicators** Temperature Profile - After 11 days of RF heating



DBL.G12 **Dual Applicators** Temperature Profile - After 17 days of RF heating

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Holding

JOB NO. 3688

BORING NO. A1

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
					KRF-A1-41618			6
3" SP	2.0	1.2	Good		KRF-A1-41619	1710	> 1000	7
					KRF-A1-41620			8
3" SP	2.0	1.1	Good		KRF-A1-41621	718	400	9
								20
					KRF-A1-41728			6
3" SP	0	0						7
7' SP	1.1	1.1	Good		KRF-A1-41729	1758	450	8

16'-20' Clay, silty, w/ gravel mod-dk br

16'-18' FILL. Moist

#2 liner for analysis

#1 liner for duplicate

20' Moist

24' Hit gravel

No recovery @ 26', or gravel blocking spo

100 blows for 1' recovery

27'-28' gravel, silty, yellowish br

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating | BORING NO. A2

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/OVA HNU/SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
3" SP	2.0	2.0	Good	KRF-A2-U1009 KRF-A2-U1010	1045	360		11 12	10'-12' Clay, dark brn, w/ minor gravel, FILL #2 liner - regular, #3 liner - duplicate
3" SP	2.0	2.0	Good	KRF-A2-U1254	1058	80		13 14	12'-14' Same as 10'-12' #2 liner - regular
				KRF-A2-U1268				15 16	
3" SP	2.0	1.8	Good	KRF-A2-U1269	1107	300		17 18	16'-18' Clay, silty, sandy, w/ minor grave dark brn, FILL?, wet, #2 liner - regular #3 liner - duplica
								19 20	
3" SP	2.0	1.6	Good	KRF-A2-U1022	1123	420		21 22	moist 20'-21.5' Same as 16'-18', sampled - #2 liner 21.5'-22' Gravel, silty, some clay, yellowish brn to tan, moist
								23 24 25 26	
3" SP	1.2	1.2	Good	KRF-A2-U2629	1151	>1000		27 28	26'-27.2' Gravel, silty, some clay, chert, yellowish brn to tan, moist
								9 0 1 2 3 4 5 6 7 8 9 0	200 blows w/ 140lb hammer for 1.2' driven #2 liner - regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: PF Heating
JOB NO.: 3688
BORING NO.: E1

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.2	Good		KRF-E1-0930			11
								12
								13
								14
								15
								16
3" SP	2.0	1.7	Good		KRF-E1-U1618 KRF-E1-U1618D 0846 160			17
								18
								19
								20
								1
								2
								3
					KRF-E1-U2425			4
3" SP	0.6	0.6	Fair		KRF-E1-0934			5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

10'-12' Clay, silty, w/ gravel, dk brn, moist.
#2 liner - regular

16'-18' Gravel, clayey, yellowish brn to tan. Minor w/ fuel odor, which appears to be free product?
#2 liner regular
#1 liner duplicate
#3 liner material had slipped out partially therefore used #1 liner for dup

24'-24.6' Gravel, silty, sl. clayey, yellowish brn to tan, dry

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating
JOB NO.: 3688
BORING NO.: E2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
3" SP	2.0	1.3		KRF-E2-U1012 1303		84		11	10-12' clay, sl. silty, w/ gravel, moist,
								12	med. brn to dk brn, FILL
								13	
								14	#2 liner – regular
								15	
								16	
								17	
								18	18' Driller reports gravel
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	26'-28' Gravel, clayey
3" SP	2.0	1.8		KRF-E2-U2628 1337		220		27	
								28	
								9	#2 liner – regular
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Testing

JOB NO. 3688

BORING NO. E3

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.3	Good	KRF-E3-U1416	1631	600		14–16
3" SP	2.0	1.8	Good	KRF-E3-U1618	1644	38		16–18
3" SP	2.0	1.2	Good	KRF-E3-U2022	1657	>1000		20–22
3" SP	0.9	0.9	Good	KRF-E3-U2829	1754	480		28–29

14'-16' Clay, sandy, silty w/ gravel, moist, FILL

#2 liner - regular

16'-18' same as 14'-16' w/ wood fragments

#2 liner - regular

20'-22' Clay, sandy, w/ gravel med. brn to dk brn, moist, soft, solvent odor, FILL

#2 liner - regular

24' Gravel

28'-29' Gravel

200 blows for 0.9' drive

#1 liner - regular

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating

BORING NO.: E4

JOB NO.: 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.8	Good	RF-E4-1104	34			1
								2
								3
								4
								5
								6
								7
								8
								9
								20
								1
								2
								3
								24
3" SP	2.0	1.6	Good	RF-E4-1130	600			5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

9'-11' Clay, sandy, silty, w/ gravel, dk brn, moist at bottom, FILL

#2 liner - regular

24' Gravel

24'-26' Gravel, clayey, yellowish brn ~~stn~~, dry, solvent/fuel odor

#2 liner - regular

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

JOB NO. 3688

BORING NO. E5

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
3" SP	2.0	2.0	Good		1418	240		11	10'-12' Clay, silty, some sand, w/ gravel, dk brn, moist, FILL #2 liner - regular
3" SP	2.0	2.0	Good		1426	24		13	12'-14' Same as 10'-13'
								14	
								15	
								16	
								17	
								18	18'-20' Clay, sandy, silty, w/ gravel, dk brn, moist to wet in spots, solvent odor, FILL
3" SP	2.0	1.6	Good		1441	160		19	
								20	#2 liner - regular
3" SP	2.0	1.8	Good		1454	80		21	20'-22' Clay, sandy, silty, w/ gravel dk brn, moist to wet in spots, solvent odor, FILL
								22	
								3	#2 liner - regular
								4	
								5	
								6	
								7	
								8	
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

JOB NO. 3688

BORING NO. E6

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
								13
								14
								15
					KRF-E6-41618D			16
3" SP	2.0	1.6	Good	KRF-E6-41618	1410	180		17
								18
								19
					KRF-E6-42022			20
3" SP	2.0	1.6	Good	KRF-E6-41620	1420	>1000		21
								22
								3
								4
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

16'-18' Clay, silty, w/ some gravel, wood frags., moist, fuel odor, moist, FILL
#2 liner - reg
#3 liner - dup.

20'-22' Clay, silty, w/ some Gyps 3" diam rock clasts, moist, fuel odor, FILL
#2 liner - regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating
JOB NO. 3688
BORING NO. E7

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO	FIXED LAB. SAMPLE NO	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
					MAF-E7-0234			1	
								2	
3" SP	2.0	2.0	Good		MAF-E7-0234	70		3	12'-14' Clay, silty, sl/ sandy gravel, med brn to dk brn, moist
								4	
								5	
								6	
								7	
								8	
								9	
								10	
								11	
								12	
								13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
								30	

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT	BORING NO.
AF Heating	
JOB NO. 3688	E8

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO	FIXED LAB SAMPLE NO	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								1	
								2	
								3	
								4	
								5	
								6	
								7	18 Driller reports gravel
								8	
								9	
								20	
								1	
								22	
								23	
								24	
3" SP	1.2	1.2	Good	KAF-E8 24-26 007	9001			25	24.0'-25.2' gravel, clayey yellowish brn,
								26	Wet at bottom. 200 blows for 1.2' #2 liner - regular
3" SP	2.0	1.8	Good	KAF-E8-2628 1027	2801			27	26'-28' Same as 24'-25.2', wet,
								28	#2 liner, solvent odor
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. F1

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	0.8	Good		KAF-FI-41819 0829	74		11 12 13 14 15 16 17 18
3" SP	2.0	1.9	Wood		KAF-FI-41820 0853	>1000ppm		19 20 21 22 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0

10'-12' Clay, silty, sandy, w/ min gravel, dk brn, moist, soft, FILL

#1 liner - regular

18'-20' Gravel, clayey, dk brn, wet w/ free product 19'-20', FILL?

Fuel odor from sample

#2 liner - regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Keeting

BORING NO. F2

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
								13
								14
3" SP	2.0	1.6	Good	KRF-FX-41416	1011	240		15
								16
								17
								18
								19
								20
								21
								22
								23
								24
								25
								26
3" SP	1.5	1.5	Good	HNF-FX-42628	1038	800		27
								28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40
								41

14'-16' Clay, slightly silty, w/ gravel, moist, dk brn, slight fuel odor, soft, FILL
#2 liner - regular

24' Gravel

26'-27.5' Gravel, clayey, yellowish brn, moist, outside wet from above strong fuel/solvent odor
#2 liner - regular
210 blows for 1.5' driven

NOTES:

HALLIBURTON

FIELD LOG OF BORING (CONT'D.)

PROJECT

BORING NO. F3

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
3" SP	2.0	1.5	good		KRP-F3-410	80 1228		11	10'-12' Clay, slightly silty, w/ gravel dk brn, moist, FILL
								12	
								13	#2 liner regular
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating

BORING NO.: E1A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	0.6	Poor		RAF-E1A-U1002 @0746	0		10-12
	2.0	1.2	Good		RAF-E1A-U1018 @0750	120		16-18
	0.7	0.7			RAF-E1A-43425 @0827	700		24-25.7

10'-12' Silt, clayey, w/ gravel, some asphalt sl. moist, light to med. brn #1 liner

16'-18' Silt, clayey, w/ gravel, med. brn to dk brn moist to wet in spots, solvent odor #2 liner

Gravel at 18'

24'-25.7 Gravel, clayey, yellowish brn, moist, strong solvent odor #1 liner

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.) SHEET 2 OF 2

PROJECT: RF Heating | BORING NO.: A2A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	OVA RNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.7	Good	RAF-A2A-0724		388 @ 0735		11
								12
	2.0	1.7	Good	RAF-A2A-0124		40 @ 0748		13
								14
					RAF-A2A-0648			15
								16
	2.0	1.3	Good			74 @ 0803		17
					RAF-A2A-1622			18
								19
								20
	2.0	1.7	Good	RAF-A2A-2022		180 @ 0812		21
								22
						~~40~~		23
								24
						@ 0841		25
								26
	0.5	0.5	Good	RAF-A2A-2627		40 @ 0841		27
								28
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

10'-12' Silt, sl. clayey, w/ gravel, light brn, very dry, powdery; #2 liner, sample slightly warm

12'-14' Silt, sl. clayey; w/ gravel, light brn, very dry, powdery, #2 liner

16'-18' Silt, clayey, w/ some sand w/ minor gravel, moist to wet at bottom, solvent odor, sample slightly warm, #2 liner, dk brn.

20'-22' Silt, clayey, sandy, w/ minor gravel, dk brn, moist, solvent odor, #2 liner

23.5' gravel - driller reports

26' - 200 blows for 0.5' drive

26'-27' Gravelly, clayey, yellowish brn, moist to wet, solvent odor, #1 liner

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. A1A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	DVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
					RAF-A1A-U1618			11 12 13 14 15 16
	2.0	0.7	Good		RAF-A1A-U1618 @1610	40		17 18
	2.0	0.8	Good		RAF-A1A-U1619 @1616	90		19 20
					RAF-A1A-U1627			21 22 23 24 25 26
	0.7	0.7	Good		RAF-A1A @1647	4801		27 28 9 0 1 2 3 4 5 6 7 8 9 0

16-18' Silt, Clayey, w/ gravel, med. brn to dk brn, moist, #1 liner

18-20' Silt, clayey, w/ gravel, med. to dk brn, moist, #1 liner

200 blows for 0.7' driven

Gravel, clayey, yellowish brn, wet, solvent odor, #1 liner

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. TD7 / TD8

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								18'-25' Gravel, silty, clayey, yellowish brn to tan

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. TD6

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								11	
								12	
					KRF-TD6-U1416			13	
								14	
3" SP	2.0	0.7	POOR		T438	20		15	Clay, silty, sandy, w/ gravel, dk brn, sl moist
								16	#1 liner
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
3" SP	0.5	0						25	
	1.5	1.9	GOOD		T439	180		26	200 blows for 0.5', no recovery
				KRF+TD6-	U2527			27	Drill on down to 25'
								28	25 - 26.5' - gravel. layer
								29	# 2 liner - regular
								30	
								31	
								32	
								33	
								34	
								35	
								36	
								37	
								38	
								39	
								40	

NOTES:

HALLIBURTON NUS

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. TD5

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								1	
								2	
								3	
								4	14'-16' Clay, silty, sandy gravel, dk brn, moist, solvent odor, FILL
3" SP	2.0	1.0	Good	KAF-TD5-U1416	0956	360		5	
								6	
								7	
								8	#1 liner - regular
								9	16' Driller reports gravel
								20	
								1	
								2	
								3	
								4	24'-24.8' Gravel, clayey, yellowish brn, moist to wet, solvent odor.
3" SP	0.8	0.8	Good	KAF-TD5-U2425	1028	>1000		5	
								6	
								7	#1 liner - regular
								8	270 blows for 0.8' drive
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 1

PLAN

PROJECT: RF Heating	BORING NO.: TD4
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 15	
TIME STARTED 1345	DATE 1/13/94
TIME COMPLETED 1425	DATE 1/13/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, mid 60°F, NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

gravel at surface.

Hand drilling at 6' and 8'

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Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: TD3
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4"	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 26.0	
TIME STARTED 0953	DATE 1/13/94
TIME COMPLETED 1135	DATE 1/13/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly cloudy, mid 50's, mod. NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	0-1' Gravel at sfc. 1- Clay, silty, med. to dk brown w/ gravel, moist, #1 liner - regular
								2	
								3	
3" SP	2.0	0.7	good		KRF-TD3-011406 200	42		4–6	4-6' Clay, silty, med to dk brn, w/ gravel, moist
								7	
								8	
								9	

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF ___

PLAN

PROJECT: RF Heating	BORING NO.: TD1 / TD2
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 26	
TIME STARTED 1435	DATE 1/13/94
TIME COMPLETED 1541	DATE 1/13/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, upper 60°F, mod. NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	Gravel at sfc.
								2	
								3	Clay, silty, w/ gravel, rubber, wire, wood, FILL, moist.
								4	
								5	
								6	
								7	
								8	
								9	

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET: 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F5
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼" ID	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 24.2	
TIME STARTED: 0810	DATE: 1/17/94
TIME COMPLETED: 0950	DATE: 1/17/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED. TIME	DATE
WEATHER CONDITIONS: Partly cloudy, mid 40°F, strong N wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9

COMMENTS: Gravel at sfc.

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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F4
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem auger	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.) 29	
TIME STARTED 1454	DATE 1/14/94
TIME COMPLETED 1646	DATE 1/14/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Fair, upper 50°SF, SW wind moderate	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.3	Good	A/F-F4-0002 1502 2				1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

0 - 0. Gravel

0 - 2' Clay, silty, w/ gravel, asphalt frags.; med. lbn to dk lbn slightly moist, FILL

#2 liner - regular

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. F4

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
					KRF-F4-U1214			12
3" SP	2.0	1.2	Good	KRF-F4 15'16	38			13
								14
								15
					KRF-F4-U1618			16
3" SP	2.0	0.6	Fair	KRF-F4 1528	44			17
								18
								19
								20
								21
								22
								23
								24
								25
								26
								27
					KRF-F4-U2830			28
3" SP	1.2	1.2		KRF-F4 1604	>1000			29
								30
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

12'-14'
Clay, sl. silty, w/ gravel, dk brn, moist, FILL, some wood fragments

16'-18'

#1 liner - regular

24' Gravel, clayey, yellowish brn

28-29' Gravel, clayey, yellowish brn

230 blows for 1.2' drive

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. F5

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
					U124			12
3" SP	2.0	0.8	Good	KRF-F5 0832	22			13
								14
								15
								16
3" SP	2.0	1.2	Good	KRF-F5 0837	U1618 >1000			17
								18
3" SP	2.0	1.5	Good	KRF-F5 0850	U1620 550			19
								20
								21
					U2324			22
3" SP	1.2	1.2	Good	KRF-F5 0934	120			23
								24
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

12-14' Clay, silty, w/ gravel, dk brn, moist, soft, FILL

#1 liner - regular

16-18' Clay, silty, w/ gravel, dk brn, moist, soft, slight fuel odor, FILL

#2 liner - regular

18-20' Clay, silty, sandy, w/ gravel, dk brn, moist, slight fuel odor, wet, FILL

22' Fill gravel ↑ 3" block of wood

#2 liner - regular nail

22'-24' Gravel, 200 blows for 0.3' driven, no recovery, will drill down to 23' and try again

23'-24.2' Gravel, clayey, yellowish brn to tan, dry

200 blows for 1.2' driven

#2 liner - regular

NOTES:

HALLIBURTON

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Flooding

BORING NO. TD1 / TD2

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								20	
								1	
								2	
								3	
								4	24' Gravel
								5	
								6	
								7	
								8	
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. TD3

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/OVA HNU/OSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								10	
								20	
								30	
				KRF-703-041416				40	
3" SP	2.0	1.8	Good	KRF-1024	50			50	14-16' Clay, silty, sandy/gravel, wood, brick, cinder frags., med. brn to dk brn, moist; FILL
								60	#2 liner - regular
								70	
								80	
								90	
								00	
								10	
				KRF-703-042426D				20	
				KRF-703-042426				30	
								40	24-26' Gravel, clayey, yellowish brn to tan, wet
3" SP	2.0	1.8	Good	KRF-1049	>1000			50	
								60	#2 liner - regular
								70	#3 liner - duplicate
								80	
								90	
								00	
								10	
								20	
								30	
								40	
								50	
								60	
								70	
								80	
								90	
								00	

NOTES:

HALLIBURTON NUS

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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT	BORING NO.
RF Heating	TD5
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼"	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 24.8	
TIME STARTED 0941	DATE 1/19/94
TIME COMPLETED 1058	DATE 1/19/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Wet	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, lo 30°F, NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	OVA HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								1	
								2	
								3	
								4	
3" SP	2.0	1.0	Fair	RF-TD5-0406 0946		2		5	
								6	
								7	
								8	
								9	

COMMENTS

4'-6' Clay, silty, dk brn, w/ gravel, slightly moist

liner - spoon

275

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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: TD6
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem Auger 4¼"	
DRILLERS NAME: John Talbot	
TOTAL DEPTH (FT.): 26.5	
TIME STARTED: 1418	DATE: 1/18/94
TIME COMPLETED: 1543	DATE: 1/18/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Partly Cloudy, mid 40°F, strong NE wind gusty	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	AMU SCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
SP	3.0	1.0	Fair	KRF-TD6-110406 1423				4

COMMENTS

#1 liner - regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET: 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: TD7 / TD8
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: SST	
DRILL RIG TYPE: Mobile B-53	
DRILLING METHOD: Hollow Stem auger	
DRILLERS NAME: John Fabbot	
TOTAL DEPTH (FT.): 25	
TIME STARTED: 1410	DATE: 1/12/94
TIME COMPLETED: 1610	DATE: 1/12/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME	DATE
WEATHER CONDITIONS: Overcast, upper 50's F, strong NE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9

COMMENTS

0-0.5' Gravel

0.5'-18 Till, clay, silty, w/ gravel med. br to dk brn, moist

277

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT	BORING NO.
RF Heating	A1A
JOB NO. 36880	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.) 27	
TIME STARTED 1526	DATE 7/11/94
TIME COMPLETED 1716	DATE 7/11/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME 1720	DATE 7/11/94
WEATHER CONDITIONS: Fair, hot, mid 90°F, light SE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	RMU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.7	Good		@1543	22		1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

Silt, clayey, w/ some gravel, light to med. brn
Very dry
#2 liner

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: A2A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 27	
TIME STARTED: 0655	DATE: 7/13/94
TIME COMPLETED: 0916	DATE: 7/13/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: ~25'	
BACKFILLED, TIME: 0926	DATE: 7/13/94
WEATHER CONDITIONS: Partly Cloudy, mid 70°sF, SE wind	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	OVA HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.1	Good		RFE-A2A-40002	34 @0706		1
	2.0	0.9	Good		RFE-A2A-40004	12 @0712		3
	2.0	1.2	Good		RFE-A2A-40006	@0725 300		5

COMMENTS,
0.0'-0.3' Sand, gravel
0.3' - 2.0' Silt, clayey, w/ gravels, brick fragment in shoe, med. brn, dry to very sl moist at bottom, #1 liner
Silt, clayey, w/ gravel, med brn, sl. moist, #1 liner
4-6' 1st run recovered 0.3' not enough for sample, pushed spoon again
Silt, sl. clayey, w/ gravel, brick fragments, very dried out, powdery, sample slightly warm, #1 liner, yellowish brn to light brn.

10279

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E1A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Augers	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 24.7	
TIME STARTED: 0647	DATE: 7/9/94
TIME COMPLETED: 0838	DATE: 7/9/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: moist @ 2.5'	
BACKFILLED, TIME: 0900	DATE: 7/9/94
WEATHER CONDITIONS: Partly Cloudy, mid 70°sF, little wind	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.3	Good		HPF-E1A-40003 @ 0708	16		1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

0.0' - 0.2' Orange brn sd (fill), gravel & sft. fill.
0.2' - 2.0' Silt, clayey, w/ gravel, med. stiff brn, sl. moist
#2 Liner

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E2A
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.) 26.6	
TIME STARTED 0917	DATE 7/9/94
TIME COMPLETED 1025	DATE 7/9/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING ~25'	
BACKFILLED, TIME 1041	DATE 7/9/94
WEATHER CONDITIONS: Partly Cloudy, hot, upper 80°F, light SE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.2	Good		1RF-E2A-0002 @ 0926	2		1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

0.0'-0.2' orange brn sand (fill) and gravel, dry

0.2'-2.0' Silt, clayey, w/gravel, med. brn

#1 liner

APPENDIX L

PERMEABILITY CALCULATIONS

Radio Frequency Heating Decontamination Demonstration
Site S-1, Kelly AFB

Contract No. F33615-90-D-4011
Delivery Order No. 0007

Calculations Prepared By: Laura H. Whitt **Date:** 12/27/94

Calculations Checked By: **Date:**

PURPOSE:

Estimate the vapor permeability of the soil at Site S-1 at several times during the demonstration of KAI's heating method.

REFERENCES:

Johnson, P., M. Kemblowski, and J. Cohart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER. 1990 May-June;28(3): 413-429.

Operating Conditions Logbook. (Data collected by Brown & Root Environmental personnel during the demonstration.)

Radian Corporation. Final Report [Vapor Stream Analysis]: Superfund Innovative Tecnology Evaluation: KAI Technologies, Inc.: Radio Frequency Heating Demonstration. Sept. 7, 1994.

Shames, Irving. Mechanics of Fluids. New York: McGraw Hill Book Company, 1982.

Subsurface pressure contours hand drawn onto Site Layout Map (Brown & Root Environmental Drawing # 3688G016.

Surface Weather Observation forms for Kelly AFB from the National Climatic Data Center (NCDC)

ASSUMPTIONS:

The viscosity of the vapor stream is estimated as the viscosity of air at the vapor stream temperature.

The flow rates measured by Radian Corporation during vapor sampling events are considered to be more accurate than the flow rates measured daily by Brown & Root Environmental.

The radius of influence (R_I) is defined as the distance from the extraction wells to the 0.5" H_2O subsurface pressure contour. R_I for these calculations was estimated based on the contours in the heated area.

Screened length for all extraction wells is 9 feet.

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. TD6A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
					KRF-TD6A-U1416			11	
								12	
								13	
								14	
	2.0	1.1	Good		KRF-TD6A-U2627	54		15	Clay, silty, w/ some gravel, sl. moist, med. to dk brn, #1 liner
								16	
						0914		17	
								18	
								19	Gravel at 19'
								20	
								21	
								22	
								23	
								24	
								25	Water at ~25'
								26	
	1.0	0.9	Good			250		27	150 blows for 1' drive
						0954		28	Gravel, clayey, yellowish brn, tan, wet, solvent smell
								9	#1 liner
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. TD5A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								11	
								12	
								13	
								14	
	2.0	1.1	Good		KRF-TD5A-J1418 @ 0710	>1000		15	Silt, clayey, w/ some gravel, med. to dk brn, sl. moist. #1 liner
								16	
								17	
								18	
								19	Gravel at 18.5'
								20	
								21	
								22	
								23	
								24	
	0.9	0.9	Good		KRF-TD5A-J2425 0745	300		25	100 blows for 0.9' driven
								26	Gravel, clayey, yellowish brn, wet in spots, solvent odor
								7	#1 liner
								8	
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating
JOB NO. 3688
BORING NO. TD3A

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	OVA/ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
								1	
								2	
								3	
								4	
	2.0	0.8	Good		KRF - TD3A - 41418	38 @1502		5	Silt, clayey, sl/some gravel, med to dk brn, moist
								6	
								7	#1 liner
								8	
								9	Gravel at ~18.5'
								20	
								21	
								22	
								23	
								24	
	1.0	0.5	Fair		KRF - TD3A - 42425 @1533	120		25	24-25' Gravel, clayey, yellowish brn, wet, solvent odor
								26	#1 liner
								7	
								8	
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: AF Heating | BORING NO.: F5A

JOB NO. 3688 0

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
	2.0	0.2	Good			0		13
					@1017			14
					KRF-FSA-41648			15
								16
	2.0	1.1	Good			198		17
					@1028			18
	2.0	1.4	Good			500		19
					KRF-FSA-41649 @1032			20
								21
								22
	1.2	1.1	Good		KRF-FSA-41624	380		23
					@1100			24
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

12'-14' Silt, clayey, w/ gravel, light brn, very stiff, powdery texture, more moist at bottom, lamb

16'-18' Silt, clayey, w/ gravel, med. brn to dk brn, moist, #2 liner

18'-20' Silt, clayey, w/ gravel, med. to dk brn, moist, wet in spots at bottom, solvent odor, #2 liner
Driller reports gravel at 21.5'

22'-23.2' Gravel, silty, clayey, yellowish brn, moist, solvent odor #2 liner

200 blows for 12" driven

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. F4A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	OVA HNU/OSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	~~2.0~~	~~1.5~~	~~Good~~		RFF-F4A-41234	~~18~~		11
	2.0	1.5	Good			@1393 18		12 13 14
					RFF-F4A-41618			15 16
	2.0	1.2	Good		RFF-F4A-41748	220 @1348		17 18
								19 20 21 22 23 24 25 26 27
	1.0	1.0	Good		RFF-F4A-42829	100 @1432		28 29 30 1 2 3 4 5 6 7 8 9 0

12'-14' Silt, clayey, sr/ some gravel, med. to dk brn, moist

#1 liner - duplicate

#2 liner - regular

16'-18' Silt, clayey, sr/ some gravel, med. to dk brn, moist, solvent odor, #2 liner

Driller reports gravel at 21'

28'-29'

200 blows for 1.0' driven

Gravel, silty, yellowish brn, wet, solvent odor, #1 liner

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	0.8	Tan		HAF-B3A-41012	100		11
						0		12
						1034		3
								4
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT: AF Heating

JOB NO. 3688 J

BORING NO. F3A

10'-12'

Silt, slightly clayey, w/gravel, light brn, very dry, powdery.

#1 Liga

NOTES:

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating

BORING NO. F2A

JOB NO. 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
								13
								14
	2.0	0.7	Good		RF F2A-41418	22		15
					@ 0803			16
								17
								18
								19
								20
								21
								22
				F2A-42627				23
								24
				F2A-2627D				25
								26
	1.0	1.4	Good	RBF-RAF		720		27
					@ 0840			28
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

14-16' Silt, clayey, w/ some gravel, light brn, dried out portion, med. to dk brn, sl. moist portion. Top part of sample is very dried out, powdery appearance, bottom half is sl. moist and very hard, more cohesive #1 liner

(Chunk of hard soil in shoe (cuttings) blocked bottom sample recovery

Driller reports gravel at 17.5'

Bottom bit is wet when pulled at 26'

26-27' 150 blows for 1.0' driven

Gravel, clayey, yellowish brn, wet, strong solvent odor

#1 liner - duplicate

#2 liner - regular

NOTES:

HALLIBURTON NUS Environmental Corporation

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FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Operating

BORING NO. FIA

JOB NO. 3688

10'-12'

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	0.6	Fair		RAF-FIA-1102 @1120	6		11
								12
								13
								14
								15
								16
								17
								18
	2.0	1.5	Good	RAF-FIA-41820	RAF-FIA-41820D	460		19
								20
					RAF-FIA @1141			1
								2
								3
								4
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

Silt, clayey, w/ gravel, light to med brn., extremely dry, powdery, #1 liner

Clay, silty, w/ gravel, dk brn, moist solvent odor

#1 liner duplicate

#2 liner regular

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT	BORING NO.
RF Heating	
JOB NO. 3688	E8A

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
					RFF-E8A-42423			24	
	1.0	0.9	Good			1358 ≥1000		25	100 blows for 1' driven in gravel
	1.0	0.8	Good			1430 ≥1000		26	gravel, silty, dayey, yellowish br, wet, strong solvent odor, #1 liner
	↓	↓	↓		RFF-E8A-42427			27	26-27'
								28	
								29	wet
								30	
								31	#1 liner
								32	
								33	
								34	
								35	
								36	
								37	
								38	
								39	
								40	

NOTES:

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Meeting
BORING NO.: E7A
JOB NO.: 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	OVA RAD SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
					4/2/14			11
								12
	2.0	1.4	Good		RF-E7A-1250	0		13
						62		14

Clay, silty, sol some gravel, moist med. to dk brn
#2 liner
#1 liner - particle analysis
#3 liner - particle analysis duplicate

NOTES:

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET ___ OF 2

PROJECT: RF Heating
JOB NO. 3688
BORING NO. E6A

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO	FIXED LAB SAMPLE NO	HNU/SCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	
					KAF-E6A-4/6/8			1	
								2	
								3	
								4	
								5	
								16	
	2.0	1.2	Good		KAF-E6A-0816	60		7	Silt, clayey, w/ gravel, med. to dk brn, sl. moist, up to 60 ppm max., ~20 ppm sustained. #1 liner, #2 liner for particle an
								18	
								9	
								20	
	2.0	0.4	Poor		KAF-E6A-0845			21	Silt, clayey, w/ gravel, med. to dk. brn, moist, solvent odor #1 liner
								22	
	1.0	0.2	Poor					3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								0	

NOTES:

HALLIBURTON NUS
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FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.4	Good		HAF-ESA-U1314	140 @ 1307		11 12
	2.0	0.7	Good		HAF-ESA-U1315	0 @ 1320		13 14
					HAF-ESA-U1320			15 16 17 18
	2.0	1.6	Good		HAF-ESA-U1321	240 @ 1331		19 20
	2.0	1.5	Good		HAF-ESA-U1322	>1000 @ 1342		21 22

PROJECT: RF Heating

JOB NO. 3688

BORING NO. E5A

10'-12' Silt, clayey, w/ gravel, light brn, very dry, powdery, #2 liner

12'-14' Silt, clayey, minor gravel, very dry, powdery #2 liner

18'-20' Silt, clayey, minor gravel, sand med. to dk brn, moist #2 liner

20'-22' Silt, clayey, sandy, minor gravel, dk brn, moist #2 liner

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating
BORING NO.: E4A
JOB NO.: 3688

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
					RAF-B52-41148			13
								14
	2.0	1.6	Good			120 @0840		15
								16
								17
								18
					RAF-B53-42022			19
								20
	2.0	1.7	Good			>1000 @0848		21
								22
								23
					RAF-E4A-42426			24
	2.0	1.9	Good			60 @0910		25
								26
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

sand, red brn, sl moist, #1 Lia
Sand has appearance of being backfill from other boreholes, possible that we have drilled into other boring, 1st sample was good though (6'-8')

14'-16' Clay, silty, w/ some gravel, red. to dk brn., moist, sample was warm, took bio sample #2, w/ plastic

24'-26' 150 blows for 2.0' drive
24'-25.1' Bentonite seal from another hole, augers have drifted into this hole.
25.1'-26' Gravel, clayey, solvent odor, wet, yellowish brn

NOTES:

HALLIBURTON NUS
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FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Lighting
JOB NO. 3688
BORING NO. E3A

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
				KRF-E3A-U1416	KRF-E3A-U1416D			11 12 13 14
	2.0	1.6	Good	KRF-E3A-U1418	KRF-E3A-U1418D	8 @ 1142		15 16
	2.0	1.6	Good	KRF-E3A-U1420	KRF-E3A-U1420D	220 @ 1150		17 18 19 20
	2.0	1.7	Good	KRF-E3A-U1422	KRF-E3A-U1422D	260 @ 1230		21 22 23 24 25 26 27 28
	0.7	0.7	Good	KRF-E3A-U1429	KRF-E3A-U1429D	190 @ 1239		29 30 1 2 3 4 5 6 7 8 9 0

14'-16' Silt, clay, some gravel, med. to dk brn, sl. moist
#1 liner - duplicate
#2 liner - regular
16'-18' Silt, clay, sandy, w/ some gravel, med brn to dk brn, moist strong solvent odor
#1 Liner duplicate
#2 liner regular
19' Gravel
20'-22' Clay, sandy, silty, minor gravel, med. to dk brn, moist, strong solvent odor
#2 liner - regular
28'-29.7 Gravel, clayey, yellowish brn wet, strong solvent odor, #1 liner

NOTES:

HALLIBURTON NUS Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT: RF Heating
JOB NO. 3688
BORING NO. E2A

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB SAMPLE NO.	HNU/OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.1	Good		E2A-41012	5		11
								12
					KRF @ 0938			13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24
					KRF-E2A-42628			25
								26
	2.0	0.6	Fair			260		27
					KRF @ 1013			28
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

10'-12' Silt, clay, w/ gravel, med. to dk brn, sl. moist
#1 liner

Gravel at 25'

26'-26.6' Gravel, clayey, yellowish brown, wet at lower 0.2', ~~strong~~ sheen on
#1 liner

NOTES:

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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E3A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow stem auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 28.7	
TIME STARTED: 1058	DATE: 7/8/94
TIME COMPLETED: 1337	DATE: 7/8/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: ~25'	
BACKFILLED, TIME: 1354	DATE: 7/8/94
WEATHER CONDITIONS: Partly Cloudy - to 90°F, SE wind	
SURFACE ELEVATION:	
COMMENTS:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) / OVA	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PROJECT: RF Heating	BORING NO.: E4A
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.) 26	
TIME STARTED 0732	DATE 7/12/94
TIME COMPLETED 0923	DATE 7/12/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING ~25'	
BACKFILLED, TIME 0940	DATE 7/12/94
WEATHER CONDITIONS: Partly cloudy, mid 70's F, SE wind	
SURFACE ELEVATION	

PLAN

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	
								2	
								3	
								4	
								5	
	2.0	0.8	Good	KRF-BH-40608	KRF-E4A-40609	0 @0757		6–8	6'-8' Silt, clayey, w/ gravel, dried out to sl. moist, red. br.
					40611			8–9	Took 8'-10' sample, but driller dropped it into decon bucket, will resample @ 9'-11'
	2.0	0.7	Fair	KRF-E4A		22 @0824		9–10	9'-11' Silt, clayey, w/ gravel, a[illegible]

300

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: ESA
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 22	
TIME STARTED: 1228	DATE: 7/12/94
TIME COMPLETED: 1357	DATE: 7/12/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME: 1357	DATE: 7/12/94
WEATHER CONDITIONS: Partly Cloudy, lo 90°SF, strong SE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
					KAF-ESA-40406			4
	0.6	0.6				10		5
	2.0	0.9	Good		@1244			6
						140		7
	2.0	1.6	Good		@1253			8
								9
								10

COMMENTS

4'-6' 1st run recovered 0.6', recovered concrete ~ 4" in spoon; ~~took~~ back in boring to get 4'-6' interval

Silt, clayey, w/ gravel, #1 liner

6'-8' Silt, clayey, w/ gravel, light brn, very dried out, powdery

#2 Liner

HALLIBURTON NUS
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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E6A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jodi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Augers	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 23	
TIME STARTED: 0737	DATE: 7/7/94
TIME COMPLETED: 0940	DATE: 7/7/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME: 0948	DATE: 7/7/94
WEATHER CONDITIONS: Partly Cloudy, mid 70°sF, SE wind, mod.	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
SP	2.0	0.4	Good		RF-E6A-40810 @0800	12		9	Silt, clayey, w/ some gravel, red. to dk brn, sl. moist #1 liner, #2 liner for pesticide analysis
								10	

HALLIBURTON NUS
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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E7A
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow ~~Stem~~ Augers	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.) 14	
TIME STARTED 1000	DATE 7/7/94
TIME COMPLETED 1102	DATE 7/7/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME 1114	DATE 7/7/94
WEATHER CONDITIONS: Partly Cloudy, upper 80°F, SE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
					KRF-E7A-40204 1014			1
								2
	2.0	1.7	Good			3		3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

Silt, clayey, w/ some gravel up to 3" diam., med brn.
#2 liner
#1 liner duplicate
#3 liner particle analysis

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: E8A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 27	
TIME STARTED: 1055	DATE: 7/7/94
TIME COMPLETED: 1450	DATE: 7/7/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: ~25'	
BACKFILLED, TIME: 1506	DATE: 7/7/94
WEATHER CONDITIONS: Partly Cloudy, mid 90's F, SE wind, gusty	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
						OVA		1
								2
								3
								4
								5
								6
	2.0	1.3	Good	KAF-E8A-10608 1314				7
								8
								9
								10

COMMENTS

Silt, clayey, some gravel, light to med brn, very dry

#2 liner

#1 liner particle analysis

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: FIA
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 20	
TIME STARTED: 1058	DATE: 7/9/94
TIME COMPLETED: 1200	DATE: 7/9/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME: 1209	DATE: 7/9/94
WEATHER CONDITIONS: Partly Cloudy, hot, upper 90°SF, slight SE wind	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) / OVA	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	2.0	0.6	Fair		RF-FIA-050406 @ 1111	0		5
								6
								7
								8
								9
								10

COMMENTS

Silty, sandy, w/ gravel, concrete, asphalt-like material, used to fill in, concrete at end of shoe blocking it.

#1 liner

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F2A
JOB NO.: 3698	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Eti	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Rason	
TOTAL DEPTH (FT.): 27.4	
TIME STARTED: 0738	DATE: 7/11/94
TIME COMPLETED: 0915	DATE: 7/11/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: ~25'	
BACKFILLED, TIME: 0920	DATE: 7/11/94
WEATHER CONDITIONS: Partly Cloudy, mid 70°sF, slight SE wind	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F3A
JOB NO.: 3688	LOGGED BY: CFB
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 12	
TIME STARTED: 1007	DATE: 7/12/94
TIME COMPLETED: 1037	DATE: 7/12/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME: 1041	DATE: 7/12/94
WEATHER CONDITIONS: Partly cloudy, upper 70°SF, SE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
						OVA		1
								2
					RF-F3A-0406			3
								4
	2.0	1.1	Good			4		5
					@1019			6
								7
								8
								9
								10

COMMENTS

4-6' Silt, clayey, w/ gravel, med brn, dried out, Bank; used #1 liner since 2nd liner had sloughed material from #1 liner - regular

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F4A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jdi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 29	
TIME STARTED: 1248	DATE: 7/11/94
TIME COMPLETED: 1450	DATE: 7/11/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: ~25'	
BACKFILLED, TIME: 1500	DATE: 7/11/94
WEATHER CONDITIONS: Fair, hot, lo 90°SF, light SE wind	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.2	Good		KAF-F4A-110002 @1305	OVA 6		1 2 3 4 5 6 7 8 9 10

COMMENTS: Silt, clayey, w/ gravel, red lo to dk lo; dry to sl moist; w/ brick fragments, #2 liner

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: F5A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jesdi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 23.2	
TIME STARTED: 0942	DATE: 7/11/94
TIME COMPLETED: 1123	DATE: 7/11/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING	
BACKFILLED, TIME: 1129	DATE: 7/11/94
WEATHER CONDITIONS: Partly Cloudy, mid 80°F, light SE wind	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

COMMENTS

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: TD3A
JOB NO. 36880	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.) 25	
TIME STARTED 1420	DATE 7/8/94
TIME COMPLETED 1554	DATE 7/8/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING ~25'	
BACKFILLED, TIME 1604	DATE 7/8/94
WEATHER CONDITIONS: Partly Cloudy, upper 90°s F, moderate SE [illegible]	
SURFACE ELEVATION	

	SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
									1	
									2	
									3	
4-5		1.0	0.2	Poor			28		4	4.0'-4.2' Silt, clayey w/ gravel, piece of concrete at end of sampler blocking sample recovery
5-7'		2.0	0.2				6		5–6	Concrete still preventing good recovery, will go down 1' and try again.
6.5-8.5		2.0	0.6	Poor	KRF-TD3A-00608 @ 1450				7–8	6.5'-8.5' Silt, clayey, w/ gravel, med- to dk brn; sl. moist #1 liner
									9	
									10	

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: TD5A
JOB NO. 3688	LOGGED BY: BDH
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.) 78	
TIME STARTED 0643	DATE 7/8/94
TIME COMPLETED 0812	DATE 7/8/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: Dry	
BACKFILLED, TIME 0822	DATE 7/8/94
WEATHER CONDITIONS: Partly Cloudy	
SURFACE ELEVATION	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	~~HNU~~ OVA SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	COMMENTS
								1	
								2	
								3	
								4	
	2.0	1.1	Good		KRF - TD5A - U0406	4 0654		5	Silt, clayey, w/ some gravel med. to dk br, sl. moist #1 liner
								6	
								7	
								8	
								9	
								10	

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT: RF Heating	BORING NO.: TD6A
JOB NO.: 3688	LOGGED BY: BDH
PROJ. MGR.: CFB	EDITED BY:
DRILLING COMPANY: Jedi	
DRILL RIG TYPE: Mobile B-61	
DRILLING METHOD: Hollow Stem Auger	
DRILLERS NAME: Ramon	
TOTAL DEPTH (FT.): 27	
TIME STARTED: 0846	DATE: 7/8/94
TIME COMPLETED: 1012	DATE: 7/8/94
GROUND-WATER CONDITION AT COMPLETION OF DRILLING: 25'	
BACKFILLED, TIME: 1030	DATE: 7/8/94
WEATHER CONDITIONS: Partly Cloudy, Lo 80°SF, SE wind	
SURFACE ELEVATION:	

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)
					KRF: TD6A-40406			1 2 3 4
	2.0	0.4	Good			3		5 6
								7 8 9 10

COMMENTS

Silt, clayey, w/ some gravel, yellowish Br, med Br, mottled, sl. moist, #1 Liner

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PERMEABILITY CALCULATIONS

CALCULATIONS: APPENDIX L

Equation used for calculations (from Reference 1):

$$k = \frac{Q\,\mu\left[\ln\left(R_w / R_I\right)\right]}{H\,\pi P_w\left[1-\left(P_{ATM}/P_W\right)^2\right]}$$

where:

k = vapor permeability
Q = vapor flow rate (ASCFM)
μ = viscosity (lb·s/ft^2)
R_W = well radius (ft.)
R_I = radius of influence (ft.)
H = total screen length (ft.)
P_W = pressure at well (lb/ft^2)
P_{ATM} = atmospheric pressure (lb/ft^2)

Example Calculation (Data for 5/6/94):

Convert Barometric Pressure to P_{ATM} in lb/ft^2:

$$P_{ATM} = 29.3\,in_{\cdot Hg}\left(\frac{14.696\ lb/in^2}{29.921\ in_{Hg}}\right)\left(\frac{12\,in}{1ft}\right)^2$$

P_{ATM} = 2072

Convert Differential Pressure, V, at Well To Absolute Pressure, P_W, in lb/ft^2:

$$P_W = P_{ATM} + V\left(\frac{14.696\ lb/in^2}{406.8\,in_{H_2O}}\right)\left(\frac{12\,in}{1ft}\right)^2$$

$$P_w = 2072 + \left(-38.5\,in_{H_2O}\right)\left(\frac{14.696\ lb/in^2}{406.8\,in_{H_2O}}\right)\left(\frac{12\,in}{1ft}\right)^2$$

P_W = 1872

Total Screen Length, H.:

H = (# of wells)(9ft)
H = (3)(9)

H = 27

PARAMETER	9 E8 KRF-E8-U2628 26 - 28			9 F1 KRF-F1-U0406 4 - 6			9 F1 KRF-F1-U1012 10 - 12			9 F1 KRF-F1-U1820 18 - 20		
418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
Hydrocarbons	2060	(27.5)	[1]	6910	(147)	[5]	1240	(33.6)	[1]	5440	(158)	[5]
W8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	NA			ND	(1.83)	[1]	NA			NA		
1,1,2,2-Tetrachloroethane	NA			ND	(4.98)	[1]	NA			NA		
1,1,2-Trichloroethane	NA			ND	(1.5)	[1]	NA			NA		
1,1-Dichloroethane	NA			ND	(1.68)	[1]	NA			NA		
1,1-Dichloroethene	NA			ND	(2.52)	[1]	NA			NA		
1,2-Dichloroethane	NA			ND	(1.7)	[1]	NA			NA		
1,2-Dichloropropane	NA			ND	(2.57)	[1]	NA			NA		
2-Chloroethyl vinyl ether	NA			ND	(2.81)	[1]	NA			NA		
2-Hexanone	NA			ND	(0.941)	[1]	NA			NA		
4-Methyl-2-Pentanone(MIBK)	NA			ND	(0.898)	[1]	NA			NA		
Acetone	NA			13.7 B	(1.47)	[1]	NA			NA		
Benzene	NA			ND	(1.69)	[1]	NA			NA		
Bromodichloromethane	NA			ND	(1.6)	[1]	NA			NA		
Bromomethane	NA			ND	(1.97)	[1]	NA			NA		
Carbon disulfide	NA			ND	(2.54)	[1]	NA			NA		
Carbon tetrachloride	NA			ND	(1.96)	[1]	NA			NA		
Chlorobenzene	NA			9.95	(4.56)	[1]	NA			NA		
Chloroethane	NA			ND	(2.01)	[1]	NA			NA		
Chloroform	NA			ND	(2.05)	[1]	NA			NA		
Chloromethane	NA			ND	(2.39)	[1]	NA			NA		
Dibromochloromethane	NA			ND	(1.8)	[1]	NA			NA		
Ethyl benzene	NA			ND	(1.62)	[1]	NA			NA		
Methyl ethyl ketone	NA			8.07 B	(1.5)	[1]	NA			NA		
Methylene Chloride	NA			4.92	(2.56)	[1]	NA			NA		
Styrene	NA			ND	(1.59)	[1]	NA			NA		
Tetrachloroethene	NA			ND	(4.66)	[1]	NA			NA		
Toluene	NA			2.93	(1.67)	[1]	NA			NA		
Tribromomethane(Bromoform)	NA			ND	(1.48)	[1]	NA			NA		
Trichloroethene	NA			ND	(4.77)	[1]	NA			NA		
Vinyl Chloride	NA			ND	(2.03)	[1]	NA			NA		
Vinyl acetate	NA			ND	(10.8)	[1]	NA			NA		
Xylene (total)	NA			ND	(3.57)	[1]	NA			NA		
cis-1,3-Dichloropropene	NA			ND	(1.58)	[1]	NA			NA		

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER	9 E7 KRF-E7-U0204 2 - 4			9 E7 KRF-E7-U1214 12 - 14			9 E8 KRF-E8-U0608 6 - 8			9 E8 KRF-E8-U2426 24 - 26		
W8240 - Volatile Organics, cont. (ug/kg)												
trans-1,2-Dichloroethene	ND	(2.34)	[1]	NA			ND	(2.41)	[1]	NA		
trans-1,3-Dichloropropene	ND	(1.74)	[1]	NA			ND	(1.8)	[1]	NA		
W8270 - Semivolatile Organics (ug/g)												
1,2,4-Trichlorobenzene	ND	(0.0176)	[1]	NA			ND	(0.0357)	[1]	NA		
1,2-Dichlorobenzene	ND	(0.0245)	[1]	NA			< DL	(0.0302)	[1]	NA		
1,3-Dichlorobenzene	ND	(0.0223)	[1]	NA			ND	(0.0183)	[1]	NA		
1,4-Dichlorobenzene	ND	(0.0292)	[1]	NA			ND	(0.0287)	[1]	NA		
2,4,5-Trichlorophenol	ND	(0.022)	[1]	NA			ND	(0.0286)	[1]	NA		
2,4,6-Trichlorophenol	ND	(0.0262)	[1]	NA			ND	(0.0206)	[1]	NA		
2,4-Dichlorophenol	ND	(0.0347)	[1]	NA			ND	(0.00922)	[1]	NA		
2,4-Dimethylphenol	ND	(0.0322)	[1]	NA			ND	(0.036)	[1]	NA		
2,4-Dinitrophenol	ND	(0.0447)	[1]	NA			ND	(0.114)	[1]	NA		
2,4-Dinitrotoluene	ND	(0.0273)	[1]	NA			ND	(0.0205)	[1]	NA		
2,6-Dinitrotoluene	ND	(0.0298)	[1]	NA			ND	(0.0323)	[1]	NA		
2-Chloronaphthalene	ND	(0.0262)	[1]	NA			ND	(0.0469)	[1]	NA		
2-Chlorophenol	ND	(0.0226)	[1]	NA			ND	(0.0276)	[1]	NA		
2-Methylnaphthalene	ND	(0.0232)	[1]	NA			ND	(0.0297)	[1]	NA		
2-Methylphenol	ND	(0.0125)	[1]	NA			ND	(0.0259)	[1]	NA		
2-Nitroaniline	ND	(0.0295)	[1]	NA			ND	(0.0469)	[1]	NA		
2-Nitrophenol	ND	(0.0296)	[1]	NA			ND	(0.0282)	[1]	NA		
3,3'-Dichlorobenzidine	ND	(0.0357)	[1]	NA			ND	(0.022)	[1]	NA		
3-Nitroaniline	ND	(0.0311)	[1]	NA			ND	(0.0351)	[1]	NA		
4,6-Dinitro-2-methylphenol	ND	(0.0392)	[1]	NA			ND	(0.0398)	[1]	NA		
4-Bromophenyl phenyl ether	ND	(0.0167)	[1]	NA			ND	(0.0359)	[1]	NA		
4-Chloro-3-methylphenol	ND	(0.016)	[1]	NA			ND	(0.0271)	[1]	NA		
4-Chlorophenyl phenyl ether	ND	(0.0187)	[1]	NA			ND	(0.0234)	[1]	NA		
4-Methylphenol/3-Methylphenol	ND	(0.0146)	[1]	NA			ND	(0.0179)	[1]	NA		
4-Nitroaniline	ND	(0.0435)	[1]	NA			ND	(0.0444)	[1]	NA		
4-Nitrophenol	ND	(0.0463)	[1]	NA			ND	(0.114)	[1]	NA		
Acenaphthene	ND	(0.0255)	[1]	NA			ND	(0.0296)	[1]	NA		
Acenaphthylene	ND	(0.0253)	[1]	NA			ND	(0.0259)	[1]	NA		
Anthracene	ND	(0.0305)	[1]	NA			ND	(0.024)	[1]	NA		
Benzo(a)anthracene	0.0787	(0.0237)	[1]	NA			0.0309	(0.0225)	[1]	NA		
Benzo(a)pyrene	0.0831	(0.0317)	[1]	NA			0.0385	(0.0284)	[1]	NA		
Benzo(b)fluoranthene	0.169 F	(0.0419)	[1]	NA			0.0987 F	(0.0287)	[1]	NA		

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

ARAMETER	9 E6 KRF-E6-U0810 8 - 10			9 E6 KRF-E6-U1618 16 - 18			9 E6 KRF-E6-U1618D 16 - 18			9 E6 KRF-E6-U2022 20 - 22		
8270 - Semivolatile Organics, cont. (ug/g)												
enzo(g,h,i)perylene	0.17	(0.134)	[1]	ND	(0.149)	[1]	ND	(0.147)	[1]	ND	(1.33)	[1]
enzo(k)fluoranthene	1.04 F	(0.13)	[1]	ND	(0.145)	[1]	ND	(0.143)	[1]	ND	(1.29)	[1]
enzoic acid	ND	(3.09)	[1]	ND	(3.45)	[1]	ND	(3.4)	[1]	ND	(30.6)	[1]
enzyl alcohol	ND	(0.0638)	[1]	ND	(0.0712)	[1]	ND	(0.0701)	[1]	ND	(0.632)	[1]
utylbenzylphthalate	< DL	(0.216)	[1]	ND	(0.241)	[1]	ND	(0.238)	[1]	ND	(2.14)	[1]
hrysene	0.65	(0.118)	[1]	ND	(0.131)	[1]	ND	(0.129)	[1]	ND	(1.16)	[1]
i-n-octylphthalate	ND	(0.0611)	[1]	ND	(0.0681)	[1]	ND	(0.0672)	[1]	ND	(0.605)	[1]
ibenz(a,h)anthracene	ND	(0.119)	[1]	ND	(0.132)	[1]	ND	(0.13)	[1]	ND	(1.17)	[1]
ibenzofuran	< DL	(0.0657)	[1]	ND	(0.0733)	[1]	ND	(0.0722)	[1]	ND	(0.65)	[1]
ibutylphthalate	ND	(0.0586)	[1]	ND	(0.0654)	[1]	ND	(0.0644)	[1]	0.679	(0.58)	[1]
iethylphthalate	ND	(0.0301)	[1]	ND	(0.0335)	[1]	ND	(0.0331)	[1]	ND	(0.298)	[1]
imethylphthalate	ND	(0.0531)	[1]	ND	(0.0592)	[1]	ND	(0.0584)	[1]	ND	(0.526)	[1]
iphenylamine	ND	(0.107)	[1]	ND	(0.119)	[1]	ND	(0.117)	[1]	ND	(1.06)	[1]
luoranthene	1.03	(0.0699)	[1]	0.104	(0.078)	[1]	ND	(0.0768)	[1]	2.19	(0.692)	[1]
luorene	0.0699	(0.0544)	[1]	ND	(0.0607)	[1]	ND	(0.0598)	[1]	ND	(0.539)	[1]
exachlorobenzene	ND	(0.0653)	[1]	ND	(0.0729)	[1]	ND	(0.0718)	[1]	ND	(0.647)	[1]
exachlorobutadiene	ND	(0.122)	[1]	ND	(0.136)	[1]	ND	(0.134)	[1]	ND	(1.21)	[1]
exachlorocyclopentadiene	ND	(0.141)	[1]	ND	(0.157)	[1]	ND	(0.155)	[1]	ND	(1.4)	[1]
exachloroethane	ND	(0.0655)	[1]	ND	(0.073)	[1]	ND	(0.0719)	[1]	ND	(0.648)	[1]
ndeno(1,2,3-cd)pyrene	0.168	(0.105)	[1]	ND	(0.117)	[1]	ND	(0.115)	[1]	ND	(1.04)	[1]
sophorone	ND	(0.0383)	[1]	ND	(0.0427)	[1]	ND	(0.0421)	[1]	ND	(0.379)	[1]
-Nitroso-di-n-propylamine	ND	(0.0731)	[1]	ND	(0.0815)	[1]	ND	(0.0803)	[1]	ND	(0.724)	[1]
aphthalene	ND	(0.0915)	[1]	0.47	(0.102)	[1]	ND	(0.101)	[1]	1.16	(0.906)	[1]
itrobenzene	ND	(0.0521)	[1]	ND	(0.0581)	[1]	ND	(0.0572)	[1]	ND	(0.515)	[1]
entachlorophenol	ND	(0.113)	[1]	ND	(0.126)	[1]	ND	(0.124)	[1]	ND	(1.12)	[1]
henanthrene	0.336	(0.0783)	[1]	0.126	(0.0873)	[1]	ND	(0.086)	[1]	< DL	(0.775)	[1]
henol	ND	(0.0442)	[1]	ND	(0.0493)	[1]	ND	(0.0486)	[1]	ND	(0.437)	[1]
yrene	0.946	(0.0839)	[1]	< DL	(0.0936)	[1]	ND	(0.0922)	[1]	< DL	(0.831)	[1]
is(2-Chloroethoxy)methane	ND	(0.075)	[1]	ND	(0.0836)	[1]	ND	(0.0824)	[1]	ND	(0.742)	[1]
is(2-Chloroethyl)ether	ND	(0.0578)	[1]	ND	(0.0645)	[1]	ND	(0.0635)	[1]	ND	(0.572)	[1]
is(2-Chloroisopropyl)ether	ND	(0.0525)	[1]	ND	(0.0586)	[1]	ND	(0.0577)	[1]	ND	(0.52)	[1]
is(2-Ethylhexyl)phthalate	< DL	(0.315)	[1]	3.18	(0.351)	[1]	< DL	(0.346)	[1]	18.1	(3.12)	[1]
-Chloroaniline	ND	(0.111)	[1]	ND	(0.124)	[1]	ND	(0.122)	[1]	ND	(1.1)	[1]
846 - Percent Moisture (percent)												
ercent moisture	16	(0)	[1]	24.3	(0)	[1]	23.1	(0)	[1]	18.9	(0)	[1]

mpiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER	9 E6 KRF-E6-U0810 8 - 10			9 E6 KRF-E6-U1618 16 - 18			9 E6 KRF-E6-U1618D 16 - 18			9 E6 KRF-E6-U2022 20 - 22		
418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
Hydrocarbons	1860	(149)	[5]	3160	(165)	[5]	233	(32.4)	[1]	22700	(615)	[20]
W8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(3.75)	[1]	ND	(41.6)	[20]	ND	(41)	[20]	ND	(2430)	[2000]
1,1,2,2-Tetrachloroethane	ND	(10.2)	[1]	ND	(85.1)	[20]	ND	(83.8)	[20]	ND	(3170)	[2000]
1,1,2-Trichloroethane	ND	(3.06)	[1]	ND	(50.8)	[20]	ND	(50)	[20]	ND	(2400)	[2000]
1,1-Dichloroethane	ND	(3.44)	[1]	ND	(48.7)	[20]	ND	(48)	[20]	ND	(1910)	[2000]
1,1-Dichloroethene	ND	(5.15)	[1]	ND	(68.7)	[20]	ND	(67.7)	[20]	ND	(4710)	[2000]
1,2-Dichloroethane	ND	(3.49)	[1]	ND	(72.4)	[20]	ND	(71.3)	[20]	ND	(3480)	[2000]
1,2-Dichloropropane	ND	(5.27)	[1]	ND	(45.3)	[20]	ND	(44.6)	[20]	ND	(6580)	[2000]
2-Chloroethyl vinyl ether	ND	(5.75)	[1]	ND	(26.3)	[20]	ND	(25.9)	[20]	ND	(3480)	[2000]
2-Hexanone	ND	(1.93)	[1]	ND	(81.4)	[20]	ND	(80.1)	[20]	ND	(3850)	[2000]
4-Methyl-2-Pentanone(MIBK)	ND	(1.84)	[1]	ND	(70.3)	[20]	ND	(69.2)	[20]	ND	(2600)	[2000]
Acetone	335 B	(3.02)	[1]	ND	(110)	[20]	ND	(108)	[20]	< DL	(14400)	[2000]
Benzene	ND	(3.47)	[1]	ND	(94.8)	[20]	ND	(93.3)	[20]	13100	(1610)	[2000]
Bromodichloromethane	ND	(3.28)	[1]	ND	(60.3)	[20]	ND	(59.4)	[20]	ND	(8810)	[2000]
Bromomethane	ND	(4.04)	[1]	ND	(96.7)	[20]	ND	(95.2)	[20]	ND	(4540)	[2000]
Carbon disulfide	ND	(5.2)	[1]	ND	(89)	[20]	ND	(87.6)	[20]	ND	(3610)	[2000]
Carbon tetrachloride	ND	(4.01)	[1]	ND	(71.9)	[20]	ND	(70.8)	[20]	ND	(3560)	[2000]
Chlorobenzene	12.4	(9.33)	[1]	2310	(57.4)	[20]	1180	(56.5)	[20]	203000	(2480)	[2000]
Chloroethane	ND	(4.11)	[1]	ND	(86.4)	[20]	ND	(85.1)	[20]	ND	(3310)	[2000]
Chloroform	ND	(4.2)	[1]	ND	(38.2)	[20]	ND	(37.6)	[20]	ND	(1480)	[2000]
Chloromethane	ND	(4.89)	[1]	ND	(73.5)	[20]	ND	(72.3)	[20]	ND	(2390)	[2000]
Dibromochloromethane	ND	(3.68)	[1]	ND	(42.9)	[20]	ND	(42.3)	[20]	ND	(1740)	[2000]
Ethyl benzene	ND	(3.33)	[1]	< DL	(62.9)	[20]	< DL	(62)	[20]	< DL	(2700)	[2000]
Methyl ethyl ketone	76.4 B	(3.06)	[1]	ND	(107)	[20]	ND	(105)	[20]	9100 B	(6770)	[2000]
Methylene Chloride	< DL	(5.25)	[1]	ND	(106)	[20]	ND	(104)	[20]	5910	(4540)	[2000]
Styrene	ND	(3.25)	[1]	ND	(45)	[20]	ND	(44.3)	[20]	ND	(2650)	[2000]
Tetrachloroethene	ND	(9.55)	[1]	ND	(68)	[20]	ND	(66.9)	[20]	ND	(3580)	[2000]
Toluene	< DL	(3.42)	[1]	127	(39.5)	[20]	63.5	(38.9)	[20]	ND	(1980)	[2000]
Tribromomethane(Bromoform)	ND	(3.04)	[1]	ND	(53.7)	[20]	ND	(52.9)	[20]	ND	(1190)	[2000]
Trichloroethene	ND	(9.76)	[1]	ND	(51.1)	[20]	ND	(50.3)	[20]	ND	(3830)	[2000]
Vinyl Chloride	ND	(4.16)	[1]	ND	(77.2)	[20]	ND	(76)	[20]	ND	(3020)	[2000]
Vinyl acetate	ND	(22)	[1]	ND	(31.1)	[20]	ND	(30.6)	[20]	ND	(2010)	[2000]
Xylene (total)	ND	(7.32)	[1]	228	(123)	[20]	< DL	(121)	[20]	ND	(6230)	[2000]
cis-1,3-Dichloropropene	ND	(3.23)	[1]	ND	(46.6)	[20]	ND	(45.9)	[20]	ND	(1330)	[2000]

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PARAMETER	9 E4 KRF-E4-U0911 9 - 11				9 E4 KRF-E4-U2426 24 - 26				9 E5 KRF-E5-U0406 4 - 6				9 E5 KRF-E5-U0608 6 - 8			
SW8270 - Semivolatile Organics, cont. (ug/g)																
Benzo(g,h,i)perylene	ND	XY	(0.222)	[5]	< DL	(0.0717)		[1]	0.0406	(0.027)		[1]	0.0883	(0.0267)		[1]
Benzo(k)fluoranthene	< DL	XY	(0.216)	[5]	ND	(0.0936)		[1]	0.244	F (0.0352)		[1]	0.735	F (0.0349)		[1]
Benzoic acid	ND	XY	(5.13)	[5]	ND	(0.639)		[1]	ND	(0.24)		[1]	ND	(0.238)		[1]
Benzyl alcohol	ND	XY	(0.106)	[5]	ND	(0.0644)		[1]	ND	(0.0242)		[1]	ND	(0.024)		[1]
Butylbenzylphthalate	ND	XY	(0.359)	[5]	ND	(0.187)		[1]	ND	(0.0705)		[1]	0.0698	(0.0598)		[1]
Chrysene	< DL	XY	(0.195)	[5]	< DL	(0.0772)		[1]	0.133	(0.029)		[1]	0.388	(0.0288)		[1]
Di-n-octylphthalate	ND	XY	(0.101)	[5]	ND	(0.0845)		[1]	< DL	(0.0318)		[1]	0.034	(0.0315)		[1]
Dibenz(a,h)anthracene	ND	XY	(0.197)	[5]	ND	(0.0775)		[1]	ND	(0.0291)		[1]	< DL	(0.0289)		[1]
Dibenzofuran	ND	XY	(0.109)	[5]	ND	(0.0589)		[1]	ND	(0.0221)		[1]	0.038	(0.0219)		[1]
Dibutylphthalate	ND	XY	(0.0973)	[5]	0.158	(0.0616)		[1]	0.0323	(0.0232)		[1]	ND	(0.023)		[1]
Diethylphthalate	ND	XY	(0.0499)	[5]	ND	(0.0403)		[1]	ND	(0.0152)		[1]	ND	(0.015)		[1]
Dimethylphthalate	ND	XY	(0.0881)	[5]	ND	(0.0421)		[1]	ND	(0.0158)		[1]	ND	(0.0157)		[1]
Diphenylamine	ND	XY	(0.177)	[5]	ND	(0.0981)		[1]	ND	(0.0369)		[1]	ND	(0.0365)		[1]
Fluoranthene	0.265	XY	(0.116)	[5]	0.703	(0.0664)		[1]	0.203	(0.025)		[1]	0.872	(0.0247)		[1]
Fluorene	ND	XY	(0.0902)	[5]	0.179	(0.0551)		[1]	< DL	(0.0207)		[1]	0.0572	(0.0205)		[1]
Hexachlorobenzene	ND	XY	(0.108)	[5]	ND	(0.0747)		[1]	ND	(0.0281)		[1]	ND	(0.0278)		[1]
Hexachlorobutadiene	ND	XY	(0.203)	[5]	ND	(0.078)		[1]	ND	(0.0293)		[1]	ND	(0.0291)		[1]
Hexachlorocyclopentadiene	ND	XY	(0.234)	[5]	ND	(0.226)		[1]	ND	(0.0848)		[1]	ND	(0.084)		[1]
Hexachloroethane	ND	XY	(0.109)	[5]	ND	(0.0893)		[1]	ND	(0.0336)		[1]	ND	(0.0332)		[1]
Indeno(1,2,3-cd)pyrene	ND	XY	(0.174)	[5]	ND	(0.0562)		[1]	0.0605	(0.0211)		[1]	0.106	(0.0209)		[1]
Isophorone	ND	XY	(0.0635)	[5]	ND	(0.081)		[1]	ND	(0.0305)		[1]	ND	(0.0302)		[1]
N-Nitroso-di-n-propylamine	ND	XY	(0.121)	[5]	ND	(0.0456)		[1]	ND	(0.0172)		[1]	ND	(0.017)		[1]
Naphthalene	ND	XY	(0.152)	[5]	3.51	(0.0671)		[1]	ND	(0.0252)		[1]	0.0271	(0.025)		[1]
Nitrobenzene	ND	XY	(0.0863)	[5]	ND	(0.121)		[1]	ND	(0.0454)		[1]	ND	(0.045)		[1]
Pentachlorophenol	ND	XY	(0.187)	[5]	ND	(0.112)		[1]	ND	(0.0422)		[1]	ND	(0.0418)		[1]
Phenanthrene	0.226	XY	(0.13)	[5]	0.271	(0.0862)		[1]	0.128	(0.0324)		[1]	0.581	(0.0321)		[1]
Phenol	ND	XY	(0.0733)	[5]	ND	(0.0353)		[1]	ND	(0.0133)		[1]	ND	(0.0131)		[1]
Pyrene	0.228	XY	(0.139)	[5]	0.0941	(0.0472)		[1]	0.194	(0.0178)		[1]	0.591	(0.0176)		[1]
bis(2-Chloroethoxy)methane	ND	XY	(0.124)	[5]	ND	(0.0887)		[1]	ND	(0.0334)		[1]	ND	(0.0331)		[1]
bis(2-Chloroethyl)ether	ND	XY	(0.0959)	[5]	ND	(0.0978)		[1]	ND	(0.0368)		[1]	ND	(0.0364)		[1]
bis(2-Chloroisopropyl)ether	ND	XY	(0.0871)	[5]	ND	(0.121)		[1]	ND	(0.0454)		[1]	ND	(0.045)		[1]
bis(2-Ethylhexyl)phthalate	ND	XY	(0.522)	[5]	2.73	B (0.158)		[1]	0.908	B (0.0593)		[1]	0.725	B (0.0588)		[1]
p-Chloroaniline	ND	XY	(0.185)	[5]	ND	(0.0941)		[1]	ND	(0.0354)		[1]	ND	(0.0351)		[1]
SW846 - Percent Moisture (percent)																
Percent moisture	14.8		(0)	[1]	7.6	(0)		[1]	16.7	(0)		[1]	15.6	(0)		[1]

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ARAMETER	9 E4 KRF-E4-U0911 9 - 11				9 E4 KRF-E4-U2426 24 - 26				9 E5 KRF-E5-U0406 4 - 6				9 E5 KRF-E5-U0608 6 - 8			
8.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)																
ydrocarbons	729		(29.3)	[1]	3660		(54)	[2]	2710		(59.9)	[2]	1530		(29.6)	[1]
8240 - Volatile Organics (ug/kg)																
1,1-Trichloroethane	ND		(1.83)	[1]	ND		(1070)	[1000]	ND		(1.86)	[1]	ND		(1.85)	[1]
1,2,2-Tetrachloroethane	ND		(4.96)	[1]	ND		(1400)	[1000]	ND		(5.06)	[1]	ND		(5.03)	[1]
1,2-Trichloroethane	ND		(1.49)	[1]	ND		(1060)	[1000]	ND		(1.52)	[1]	ND		(1.51)	[1]
1-Dichloroethane	ND		(1.68)	[1]	ND		(841)	[1000]	ND		(1.71)	[1]	ND		(1.7)	[1]
1-Dichloroethene	ND		(2.51)	[1]	ND		(2080)	[1000]	ND		(2.56)	[1]	ND		(2.55)	[1]
2-Dichloroethane	ND		(1.7)	[1]	ND		(1540)	[1000]	ND		(1.73)	[1]	ND		(1.72)	[1]
2-Dichloropropane	ND		(2.56)	[1]	ND		(2900)	[1000]	ND		(2.62)	[1]	ND		(2.6)	[1]
-Chloroethyl vinyl ether	ND		(2.8)	[1]	ND		(1540)	[1000]	ND		(2.85)	[1]	ND		(2.84)	[1]
-Hexanone	ND		(0.937)	[1]	ND		(1700)	[1000]	ND		(0.956)	[1]	ND		(0.951)	[1]
-Methyl-2-Pentanone(MIBK)	ND		(0.894)	[1]	ND		(1150)	[1000]	ND		(0.913)	[1]	ND		(0.908)	[1]
cetone	194	B	(1.47)	[1]	< DL		(6350)	[1000]	24.8	B	(1.5)	[1]	13	B	(1.49)	[1]
enzene	< DL		(1.69)	[1]	823		(711)	[1000]	< DL		(1.72)	[1]	< DL		(1.71)	[1]
romodichloromethane	ND		(1.59)	[1]	ND		(3890)	[1000]	ND		(1.63)	[1]	ND		(1.62)	[1]
romomethane	ND		(1.96)	[1]	ND		(2000)	[1000]	ND		(2)	[1]	ND		(1.99)	[1]
arbon disulfide	ND		(2.53)	[1]	ND		(1590)	[1000]	ND		(2.58)	[1]	ND		(2.57)	[1]
arbon tetrachloride	ND		(1.95)	[1]	ND		(1570)	[1000]	ND		(1.99)	[1]	ND		(1.98)	[1]
hlorobenzene	6.77		(4.54)	[1]	239000		(4720)	[2000]	7.41		(4.63)	[1]	12.6		(4.61)	[1]
hloroethane	ND		(2)	[1]	ND		(1460)	[1000]	ND		(2.04)	[1]	ND		(2.03)	[1]
hloroform	ND		(2.04)	[1]	ND		(652)	[1000]	ND		(2.09)	[1]	ND		(2.08)	[1]
hloromethane	ND		(2.38)	[1]	1350		(1060)	[1000]	ND		(2.43)	[1]	ND		(2.42)	[1]
ibromochloromethane	ND		(1.79)	[1]	ND		(767)	[1000]	ND		(1.83)	[1]	ND		(1.82)	[1]
thyl benzene	ND		(1.62)	[1]	1360		(1190)	[1000]	ND		(1.65)	[1]	ND		(1.64)	[1]
ethyl ethyl ketone	48.1	B	(1.49)	[1]	4370	B	(2990)	[1000]	9.61	B	(1.52)	[1]	8.13	B	(1.51)	[1]
ethylene Chloride	3.28		(2.55)	[1]	3100		(2000)	[1000]	8.68		(2.61)	[1]	4.33		(2.59)	[1]
tyrene	ND		(1.58)	[1]	ND		(1170)	[1000]	ND		(1.62)	[1]	ND		(1.61)	[1]
etrachloroethene	ND		(4.64)	[1]	ND		(1580)	[1000]	ND		(4.74)	[1]	ND		(4.72)	[1]
oluene	2.54		(1.66)	[1]	< DL		(871)	[1000]	3.57		(1.7)	[1]	2.57		(1.69)	[1]
ribromomethane(Bromoform)	ND		(1.48)	[1]	ND		(524)	[1000]	ND		(1.51)	[1]	ND		(1.5)	[1]
richloroethene	ND		(4.75)	[1]	ND		(1690)	[1000]	ND		(4.85)	[1]	ND		(4.82)	[1]
inyl Chloride	ND		(2.02)	[1]	ND		(1330)	[1000]	ND		(2.06)	[1]	ND		(2.05)	[1]
inyl acetate	ND		(10.7)	[1]	ND		(887)	[1000]	ND		(10.9)	[1]	ND		(10.9)	[1]
ylene (total)	ND		(3.56)	[1]	10300		(2750)	[1000]	ND		(3.63)	[1]	ND		(3.61)	[1]
is-1,3-Dichloropropene	ND		(1.57)	[1]	ND		(587)	[1000]	ND		(1.6)	[1]	ND		(1.6)	[1]

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PARAMETER	9 E3 KRF-E3-U1618 16 - 18			9 E3 KRF-E3-U2022 20 - 22			9 E3 KRF-E3-U2829 28 - 29	9 E4 KRF-E4-U0709 7 - 9
W8240 - Volatile Organics, cont. (ug/kg)								
trans-1,2-Dichloroethene	ND	(211)	[100]	ND	(22100)	[10000]	NA	NA
trans-1,3-Dichloropropene	ND	(185)	[100]	ND	(19500)	[10000]	NA	NA
W8270 - Semivolatile Organics (ug/g)								
1,2,4-Trichlorobenzene	ND	(0.107)	[1]	11.5	(1.06)	[1]	NA	NA
1,2-Dichlorobenzene	< DL	(0.0908)	[1]	192	(0.896)	[1]	NA	NA
1,3-Dichlorobenzene	0.334	(0.0552)	[1]	14.2	(0.545)	[1]	NA	NA
1,4-Dichlorobenzene	2.42	(0.0865)	[1]	132	(0.853)	[1]	NA	NA
2,4,5-Trichlorophenol	ND	(0.0861)	[1]	ND	(0.85)	[1]	NA	NA
2,4,6-Trichlorophenol	ND	(0.0619)	[1]	ND	(0.611)	[1]	NA	NA
2,4-Dichlorophenol	ND	(0.0277)	[1]	ND	(0.274)	[1]	NA	NA
2,4-Dimethylphenol	ND	(0.100)	[1]	82.3	(1.07)	[1]	NA	NA
2,4-Dinitrophenol	ND	(0.343)	[1]	ND	(3.39)	[1]	NA	NA
2,4-Dinitrotoluene	ND	(0.0616)	[1]	ND	(0.608)	[1]	NA	NA
2,6-Dinitrotoluene	ND	(0.097)	[1]	ND	(0.958)	[1]	NA	NA
2-Chloronaphthalene	ND	(0.141)	[1]	ND	(1.39)	[1]	NA	NA
2-Chlorophenol	ND	(0.083)	[1]	ND	(0.82)	[1]	NA	NA
2-Methylnaphthalene	0.772	(0.0894)	[1]	152	(0.882)	[1]	NA	NA
2-Methylphenol	ND	(0.078)	[1]	21.7	(0.77)	[1]	NA	NA
2-Nitroaniline	ND	(0.141)	[1]	ND	(1.39)	[1]	NA	NA
2-Nitrophenol	ND	(0.0848)	[1]	ND	(0.836)	[1]	NA	NA
3,3'-Dichlorobenzidine	ND	(0.0661)	[1]	ND	(0.652)	[1]	NA	NA
3-Nitroaniline	ND	(0.105)	[1]	ND	(1.04)	[1]	NA	NA
4,6-Dinitro-2-methylphenol	ND	(0.12)	[1]	ND	(1.18)	[1]	NA	NA
4-Bromophenyl phenyl ether	ND	(0.108)	[1]	ND	(1.07)	[1]	NA	NA
4-Chloro-3-methylphenol	ND	(0.0816)	[1]	ND	(0.805)	[1]	NA	NA
4-Chlorophenyl phenyl ether	ND	(0.0704)	[1]	ND	(0.695)	[1]	NA	NA
4-Methylphenol/3-Methylphenol	ND	(0.0537)	[1]	70.2 F	(0.53)	[1]	NA	NA
4-Nitroaniline	ND	(0.134)	[1]	ND	(1.32)	[1]	NA	NA
4-Nitrophenol	ND	(0.342)	[1]	ND	(3.38)	[1]	NA	NA
Acenaphthene	ND	(0.0892)	[1]	1.27	(0.88)	[1]	NA	NA
Acenaphthylene	ND	(0.0778)	[1]	ND	(0.767)	[1]	NA	NA
Anthracene	ND	(0.0721)	[1]	ND	(0.712)	[1]	NA	NA
Benzo(a)anthracene	< DL	(0.0676)	[1]	< DL	(0.667)	[1]	NA	NA
Benzo(a)pyrene	ND	(0.0854)	[1]	< DL	(0.843)	[1]	NA	NA
Benzo(b)fluoranthene	0.0895 F	(0.0862)	[1]	< DL	(0.851)	[1]	NA	NA

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

ARAMETER	9 E2 KRF-E2-U0002 0 - 2			9 E2 KRF-E2-U1012 10 - 12			9 E2 KRF-E2-U2628 26 - 28			9 E3 KRF-E3-U1416 14 - 16		
18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
ydrocarbons	1730	(32)	[1]	141	(33.7)	[1]	4440	(147)	[5]	1210	(32.1)	[1]
846 - Percent Moisture (percent)												
ercent moisture	22.1	(0)	[1]	26.2	(0)	[1]	15.1	(0)	[1]	22.3	(0)	[1]

ompiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER	9 E1 KRF-E1-U1012 10 - 12				9 E1 KRF-E1-U1618 16 - 18				9 E1 KRF-E1-U1618D 16 - 18				9 E1 KRF-E1-U2425 24 - 25			
V8240 - Volatile Organics, cont. (ug/kg)																
trans-1,2-Dichloroethene	NA				ND		(896)	[500]	ND		(894)	[500]	ND		(1770)	[1000]
trans-1,3-Dichloropropene	NA				ND		(789)	[500]	ND		(787)	[500]	ND		(1560)	[1000]
V8270 - Semivolatile Organics (ug/g)																
1,2,4-Trichlorobenzene	NA				ND		(0.0466)	[1]	ND		(0.0475)	[1]	3.23		(0.437)	[1]
1,2-Dichlorobenzene	NA				0.258		(0.0651)	[1]	0.344		(0.0663)	[1]	112		(0.611)	[1]
1,3-Dichlorobenzene	NA				0.587		(0.0592)	[1]	0.68		(0.0603)	[1]	7.29		(0.556)	[1]
1,4-Dichlorobenzene	NA				1.03		(0.0775)	[1]	1.15		(0.0789)	[1]	17.5		(0.727)	[1]
2,4,5-Trichlorophenol	NA				ND	X	(0.0583)	[1]	ND	X	(0.0593)	[1]	ND		(0.547)	[1]
2,4,6-Trichlorophenol	NA				ND	X	(0.0694)	[1]	ND	X	(0.0707)	[1]	ND		(0.651)	[1]
2,4-Dichlorophenol	NA				ND		(0.0922)	[1]	ND		(0.0939)	[1]	ND		(0.865)	[1]
2,4-Dimethylphenol	NA				ND		(0.0855)	[1]	ND		(0.087)	[1]	ND		(0.802)	[1]
2,4-Dinitrophenol	NA				ND	X	(0.119)	[1]	ND	X	(0.121)	[1]	ND		(1.11)	[1]
2,4-Dinitrotoluene	NA				ND	X	(0.0724)	[1]	ND	X	(0.0738)	[1]	ND		(0.68)	[1]
2,6-Dinitrotoluene	NA				ND	X	(0.0789)	[1]	ND	X	(0.0804)	[1]	ND		(0.741)	[1]
2-Chloronaphthalene	NA				ND	X	(0.0696)	[1]	ND	X	(0.0709)	[1]	ND		(0.653)	[1]
2-Chlorophenol	NA				ND		(0.0599)	[1]	ND		(0.0611)	[1]	ND		(0.563)	[1]
2-Methylnaphthalene	NA				15.7		(0.0615)	[1]	20.7		(0.313)	[5]	6.1		(0.577)	[1]
2-Methylphenol	NA				ND		(0.0333)	[1]	ND		(0.0339)	[1]	ND		(0.312)	[1]
2-Nitroaniline	NA				ND	X	(0.0782)	[1]	ND	X	(0.0797)	[1]	ND		(0.734)	[1]
2-Nitrophenol	NA				ND		(0.0785)	[1]	ND		(0.08)	[1]	ND		(0.737)	[1]
3,3'-Dichlorobenzidine	NA				ND		(0.0948)	[1]	ND		(0.0966)	[1]	ND		(0.89)	[1]
3-Nitroaniline	NA				ND	X	(0.0825)	[1]	ND	X	(0.084)	[1]	ND		(0.774)	[1]
4,6-Dinitro-2-methylphenol	NA				ND		(0.104)	[1]	ND		(0.106)	[1]	ND		(0.976)	[1]
4-Bromophenyl phenyl ether	NA				ND		(0.0444)	[1]	ND		(0.0452)	[1]	ND		(0.417)	[1]
4-Chloro-3-methylphenol	NA				ND		(0.0424)	[1]	ND		(0.0432)	[1]	ND		(0.398)	[1]
4-Chlorophenyl phenyl ether	NA				ND	X	(0.0496)	[1]	ND	X	(0.0505)	[1]	ND		(0.465)	[1]
4-Methylphenol/3-Methylphenol	NA				ND		(0.0386)	[1]	ND		(0.0393)	[1]	ND		(0.363)	[1]
4-Nitroaniline	NA				ND	X	(0.115)	[1]	ND	X	(0.118)	[1]	ND		(1.08)	[1]
4-Nitrophenol	NA				ND	X	(0.123)	[1]	ND	X	(0.125)	[1]	ND		(1.15)	[1]
Acenaphthene	NA				ND	X	(0.0677)	[1]	ND	X	(0.069)	[1]	ND		(0.635)	[1]
Acenaphthylene	NA				ND	X	(0.0671)	[1]	ND	X	(0.0683)	[1]	ND		(0.629)	[1]
Anthracene	NA				0.0856		(0.0808)	[1]	0.0895		(0.0823)	[1]	ND		(0.759)	[1]
Benzo(a)anthracene	NA				0.114		(0.063)	[1]	0.111		(0.0642)	[1]	ND		(0.591)	[1]
Benzo(a)pyrene	NA				ND		(0.0842)	[1]	ND	X	(0.0858)	[1]	ND		(0.79)	[1]
Benzo(b)fluoranthene	NA				0.216	F	(0.111)	[1]	0.305	XF	(0.113)	[1]	ND		(1.04)	[1]

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PARAMETER	9 A2 KRF-A2-U1618D 16 - 18				9 A2 KRF-A2-U2022 20 - 22				9 A2 KRF-A2-U2628 26 - 28				9 E1 KRF-E1-U0002 0 - 2			
SW8270 - Semivolatile Organics, cont. (ug/g)																
Benzo(g,h,i)perylene	ND		(0.142)	[1]	ND		(1.41)	[1]	NA				NA			
Benzo(k)fluoranthene	0.199	F	(0.138)	[1]	ND		(1.37)	[1]	NA				NA			
Benzoic acid	ND		(3.28)	[1]	ND		(32.5)	[1]	NA				NA			
Benzyl alcohol	ND		(0.0676)	[1]	ND		(0.671)	[1]	NA				NA			
Butylbenzylphthalate	ND		(0.229)	[1]	ND		(2.27)	[1]	NA				NA			
Chrysene	< DL		(0.125)	[1]	ND		(1.24)	[1]	NA				NA			
Di-n-octylphthalate	ND		(0.0648)	[1]	ND		(0.642)	[1]	NA				NA			
Dibenz(a,h)anthracene	ND		(0.126)	[1]	ND		(1.25)	[1]	NA				NA			
Dibenzofuran	0.0843		(0.0696)	[1]	0.699		(0.691)	[1]	NA				NA			
Dibutylphthalate	< DL		(0.0621)	[1]	ND		(0.616)	[1]	NA				NA			
Diethylphthalate	ND		(0.0319)	[1]	ND		(0.316)	[1]	NA				NA			
Dimethylphthalate	ND		(0.0563)	[1]	ND		(0.558)	[1]	NA				NA			
Diphenylamine	ND		(0.113)	[1]	ND		(1.12)	[1]	NA				NA			
Fluoranthene	0.308		(0.0741)	[1]	1.15		(0.735)	[1]	NA				NA			
Fluorene	0.171		(0.0577)	[1]	0.762		(0.572)	[1]	NA				NA			
Hexachlorobenzene	ND		(0.0692)	[1]	ND		(0.687)	[1]	NA				NA			
Hexachlorobutadiene	ND		(0.13)	[1]	ND		(1.28)	[1]	NA				NA			
Hexachlorocyclopentadiene	ND		(0.149)	[1]	ND		(1.48)	[1]	NA				NA			
Hexachloroethane	ND		(0.0694)	[1]	ND		(0.688)	[1]	NA				NA			
Indeno(1,2,3-cd)pyrene	ND		(0.111)	[1]	ND		(1.1)	[1]	NA				NA			
Isophorone	ND		(0.0406)	[1]	ND		(0.403)	[1]	NA				NA			
N-Nitroso-di-n-propylamine	ND		(0.0775)	[1]	ND		(0.768)	[1]	NA				NA			
Naphthalene	0.337		(0.097)	[1]	23.4		(0.962)	[1]	NA				NA			
Nitrobenzene	ND		(0.0552)	[1]	ND		(0.547)	[1]	NA				NA			
Pentachlorophenol	ND		(0.12)	[1]	ND		(1.19)	[1]	NA				NA			
Phenanthrene	0.352		(0.0829)	[1]	1.04		(0.823)	[1]	NA				NA			
Phenol	ND		(0.0468)	[1]	1.19		(0.464)	[1]	NA				NA			
Pyrene	0.213		(0.0889)	[1]	< DL		(0.882)	[1]	NA				NA			
bis(2-Chloroethoxy)methane	ND		(0.0795)	[1]	ND		(0.788)	[1]	NA				NA			
bis(2-Chloroethyl)ether	ND		(0.0613)	[1]	ND		(0.608)	[1]	NA				NA			
bis(2-Chloroisopropyl)ether	ND		(0.0557)	[1]	ND		(0.552)	[1]	NA				NA			
bis(2-Ethylhexyl)phthalate	8.73		(0.334)	[1]	4.08		(3.31)	[1]	NA				NA			
p-Chloroaniline	ND		(0.118)	[1]	ND		(1.17)	[1]	NA				NA			
SW846 - Percent Moisture (percent)																
Percent moisture	20.1		(0)	[1]	22.9		(0)	[1]	9		(0)	[1]	18.9		(0)	[1]

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER	9 A2 KRF-A2-U1618D 16 - 18			9 A2 KRF-A2-U2022 20 - 22			9 A2 KRF-A2-U2628 26 - 28			9 E1 KRF-E1-U0002 0 - 2		
418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
Hydrocarbons	12600	(624)	[20]	21200	(646)	[20]	2730	(54.9)	[2]	352	(30.8)	[1]
8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(98.6)	[50]	ND	(2050)	[1000]	NA			NA		
1,1,2,2-Tetrachloroethane	ND	(202)	[50]	ND	(4190)	[1000]	NA			NA		
1,1,2-Trichloroethane	ND	(120)	[50]	ND	(2500)	[1000]	NA			NA		
1,1-Dichloroethane	ND	(115)	[50]	ND	(2400)	[1000]	NA			NA		
1,1-Dichloroethene	ND	(163)	[50]	ND	(3380)	[1000]	NA			NA		
1,2-Dichloroethane	ND	(172)	[50]	ND	(3560)	[1000]	NA			NA		
1,2-Dichloropropane	ND	(107)	[50]	ND	(2230)	[1000]	NA			NA		
2-Chloroethyl vinyl ether	ND	(62.4)	[50]	ND	(1300)	[1000]	NA			NA		
2-Hexanone	ND	(193)	[50]	ND	(4000)	[1000]	NA			NA		
4-Methyl-2-Pentanone(MIBK)	ND	(167)	[50]	ND	(3460)	[1000]	NA			NA		
Acetone	ND	(260)	[50]	ND	(5400)	[1000]	NA			NA		
Benzene	< DL	(225)	[50]	< DL	(4660)	[1000]	NA			NA		
Bromodichloromethane	ND	(143)	[50]	ND	(2970)	[1000]	NA			NA		
Bromomethane	ND	(229)	[50]	ND	(4760)	[1000]	NA			NA		
Carbon disulfide	ND	(211)	[50]	ND	(4380)	[1000]	NA			NA		
Carbon tetrachloride	ND	(170)	[50]	ND	(3540)	[1000]	NA			NA		
Chlorobenzene	6430	(136)	[50]	35600	(2820)	[1000]	NA			NA		
Chloroethane	ND	(205)	[50]	ND	(4250)	[1000]	NA			NA		
Chloroform	ND	(90.5)	[50]	ND	(1880)	[1000]	NA			NA		
Chloromethane	ND	(174)	[50]	ND	(3620)	[1000]	NA			NA		
Dibromochloromethane	ND	(102)	[50]	ND	(2110)	[1000]	NA			NA		
Ethyl benzene	330	(149)	[50]	7280	(3100)	[1000]	NA			NA		
Methyl ethyl ketone	ND	(253)	[50]	ND	(5260)	[1000]	NA			NA		
Methylene Chloride	ND	(251)	[50]	ND	(5210)	[1000]	NA			NA		
Styrene	ND	(107)	[50]	ND	(2220)	[1000]	NA			NA		
Tetrachloroethene	ND	(161)	[50]	6470	(3340)	[1000]	NA			NA		
Toluene	< DL	(93.6)	[50]	102000	(1940)	[1000]	NA			NA		
Tribromomethane(Bromoform)	ND	(127)	[50]	ND	(2640)	[1000]	NA			NA		
Trichloroethene	ND	(121)	[50]	33900	(2510)	[1000]	NA			NA		
Vinyl Chloride	ND	(183)	[50]	ND	(3800)	[1000]	NA			NA		
Vinyl acetate	ND	(73.6)	[50]	ND	(1530)	[1000]	NA			NA		
Xylene (total)	776	(291)	[50]	57300	(6040)	[1000]	NA			NA		
cis-1,3-Dichloropropene	ND	(110)	[50]	ND	(2290)	[1000]	NA			NA		

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PARAMETER	9 A2 KRF-A2-U1012 10 - 12	9 A2 KRF-A2-U1012D 10 - 12	9 A2 KRF-A2-U1214 12 - 14	9 A2 KRF-A2-U1618 16 - 18			
W8240 - Volatile Organics, cont. (ug/kg)							
trans-1,2-Dichloroethene	NA	NA	NA	ND		(421)	[200]
trans-1,3-Dichloropropene	NA	NA	NA	ND		(470)	[200]
W8270 - Semivolatile Organics (ug/g)							
1,2,4-Trichlorobenzene	NA	NA	NA	ND		(0.0553)	[1]
1,2-Dichlorobenzene	NA	NA	NA	0.404		(0.0772)	[1]
1,3-Dichlorobenzene	NA	NA	NA	0.735		(0.0703)	[1]
1,4-Dichlorobenzene	NA	NA	NA	5.05		(0.092)	[1]
2,4,5-Trichlorophenol	NA	NA	NA	ND		(0.0691)	[1]
2,4,6-Trichlorophenol	NA	NA	NA	ND		(0.0824)	[1]
2,4-Dichlorophenol	NA	NA	NA	ND		(0.109)	[1]
2,4-Dimethylphenol	NA	NA	NA	ND		(0.101)	[1]
2,4-Dinitrophenol	NA	NA	NA	ND		(0.141)	[1]
2,4-Dinitrotoluene	NA	NA	NA	ND		(0.086)	[1]
2,6-Dinitrotoluene	NA	NA	NA	ND		(0.0937)	[1]
2-Chloronaphthalene	NA	NA	NA	ND		(0.0826)	[1]
2-Chlorophenol	NA	NA	NA	ND		(0.0711)	[1]
2-Methylnaphthalene	NA	NA	NA	2.13		(0.073)	[1]
2-Methylphenol	NA	NA	NA	ND		(0.0395)	[1]
2-Nitroaniline	NA	NA	NA	ND		(0.0928)	[1]
2-Nitrophenol	NA	NA	NA	ND		(0.0932)	[1]
3,3'-Dichlorobenzidine	NA	NA	NA	ND		(0.113)	[1]
3-Nitroaniline	NA	NA	NA	ND		(0.0979)	[1]
4,6-Dinitro-2-methylphenol	NA	NA	NA	ND		(0.123)	[1]
4-Bromophenyl phenyl ether	NA	NA	NA	ND		(0.0527)	[1]
4-Chloro-3-methylphenol	NA	NA	NA	ND		(0.0503)	[1]
4-Chlorophenyl phenyl ether	NA	NA	NA	ND		(0.0588)	[1]
4-Methylphenol/3-Methylphenol	NA	NA	NA	ND		(0.0458)	[1]
4-Nitroaniline	NA	NA	NA	ND		(0.137)	[1]
4-Nitrophenol	NA	NA	NA	ND		(0.146)	[1]
Acenaphthene	NA	NA	NA	ND		(0.0804)	[1]
Acenaphthylene	NA	NA	NA	ND		(0.0796)	[1]
Anthracene	NA	NA	NA	ND		(0.0959)	[1]
Benzo(a)anthracene	NA	NA	NA	< DL		(0.0748)	[1]
Benzo(a)pyrene	NA	NA	NA	0.189	X	(0.0999)	[1]
Benzo(b)fluoranthene	NA	NA	NA	0.172	XF	(0.132)	[1]

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PARAMETER	9 A1 KRF-A1-U2728 27 - 28			9 A2 KRF-A2-U0002 0 - 2			9 A2 KRF-A2-U0204 2 - 4			9 A2 KRF-A2-U0406 4 - 6		
SW8270 - Semivolatile Organics, cont. (ug/g)												
Benzo(g,h,i)perylene	ND	(1.11)	[1]	0.195	(0.0463)	[1]	0.196	(0.0477)	[1]	0.0581	(0.0463)	[1]
Benzo(k)fluoranthene	ND	(1.08)	[1]	1.03 F	(0.0451)	[1]	1.12 F	(0.0465)	[1]	0.422 F	(0.0451)	[1]
Benzoic acid	ND	(25.7)	[1]	ND	(1.07)	[1]	ND	(1.1)	[1]	ND	(1.07)	[1]
Benzyl alcohol	ND	(0.53)	[1]	ND	(0.0221)	[1]	ND	(0.0227)	[1]	ND	(0.0221)	[1]
Butylbenzylphthalate	ND	(1.8)	[1]	ND	(0.0748)	[1]	ND	(0.077)	[1]	ND	(0.0748)	[1]
Chrysene	ND	(0.976)	[1]	0.438	(0.0406)	[1]	0.59	(0.0418)	[1]	0.215	(0.0406)	[1]
Di-n-octylphthalate	ND	(0.508)	[1]	ND	(0.0211)	[1]	ND	(0.0218)	[1]	ND	(0.0211)	[1]
Dibenz(a,h)anthracene	ND	(0.986)	[1]	0.0662	(0.041)	[1]	0.09	(0.0423)	[1]	ND	(0.041)	[1]
Dibenzofuran	ND	(0.546)	[1]	0.041	(0.0227)	[1]	< DL	(0.0234)	[1]	ND	(0.0227)	[1]
Dibutylphthalate	ND	(0.487)	[1]	ND	(0.0203)	[1]	ND	(0.0209)	[1]	0.0431	(0.0203)	[1]
Diethylphthalate	ND	(0.25)	[1]	ND	(0.0104)	[1]	ND	(0.0107)	[1]	ND	(0.0104)	[1]
Dimethylphthalate	ND	(0.441)	[1]	ND	(0.0184)	[1]	ND	(0.0189)	[1]	ND	(0.0184)	[1]
Diphenylamine	ND	(0.886)	[1]	ND	(0.0369)	[1]	ND	(0.038)	[1]	ND	(0.0369)	[1]
Fluoranthene	ND	(0.581)	[1]	0.821	(0.0242)	[1]	1.16	(0.0249)	[1]	0.339	(0.0242)	[1]
Fluorene	ND	(0.452)	[1]	0.0356	(0.0188)	[1]	0.0544	(0.0194)	[1]	ND	(0.0188)	[1]
Hexachlorobenzene	ND	(0.543)	[1]	ND	(0.0226)	[1]	ND	(0.0233)	[1]	ND	(0.0226)	[1]
Hexachlorobutadiene	ND	(1.02)	[1]	ND	(0.0423)	[1]	ND	(0.0435)	[1]	ND	(0.0422)	[1]
Hexachlorocyclopentadiene	ND	(1.17)	[1]	ND	(0.0488)	[1]	ND	(0.0502)	[1]	ND	(0.0488)	[1]
Hexachloroethane	ND	(0.544)	[1]	ND	(0.0226)	[1]	ND	(0.0233)	[1]	ND	(0.0226)	[1]
Indeno(1,2,3-cd)pyrene	ND	(0.87)	[1]	0.183	(0.0362)	[1]	0.185	(0.0373)	[1]	0.0512	(0.0362)	[1]
Isophorone	ND	(0.318)	[1]	ND	(0.0132)	[1]	ND	(0.0136)	[1]	ND	(0.0132)	[1]
N-Nitroso-di-n-propylamine	ND	(0.607)	[1]	ND	(0.0253)	[1]	ND	(0.026)	[1]	ND	(0.0253)	[1]
Naphthalene	ND	(0.761)	[1]	ND	(0.0317)	[1]	ND	(0.0326)	[1]	ND	(0.0316)	[1]
Nitrobenzene	ND	(0.433)	[1]	ND	(0.018)	[1]	ND	(0.0185)	[1]	ND	(0.018)	[1]
Pentachlorophenol	ND	(0.938)	[1]	ND	(0.039)	[1]	ND	(0.0402)	[1]	ND	(0.039)	[1]
Phenanthrene	ND	(0.65)	[1]	0.393	(0.0271)	[1]	0.506	(0.0279)	[1]	0.13	(0.0271)	[1]
Phenol	ND	(0.367)	[1]	ND	(0.0153)	[1]	ND	(0.0157)	[1]	ND	(0.0153)	[1]
Pyrene	ND	(0.697)	[1]	0.652	(0.029)	[1]	0.911	(0.0299)	[1]	0.321	(0.029)	[1]
bis(2-Chloroethoxy)methane	ND	(0.623)	[1]	ND	(0.0259)	[1]	ND	(0.0267)	[1]	ND	(0.0259)	[1]
bis(2-Chloroethyl)ether	ND	(0.48)	[1]	ND	(0.02)	[1]	ND	(0.0206)	[1]	ND	(0.02)	[1]
bis(2-Chloroisopropyl)ether	ND	(0.436)	[1]	ND	(0.0182)	[1]	ND	(0.0187)	[1]	ND	(0.0182)	[1]
bis(2-Ethylhexyl)phthalate	< DL	(2.62)	[1]	1.32	(0.109)	[1]	0.126	(0.112)	[1]	0.686	(0.109)	[1]
p-Chloroaniline	ND	(0.926)	[1]	ND	(0.0385)	[1]	ND	(0.0397)	[1]	ND	(0.0385)	[1]
SW846 - Percent Moisture (percent)												
Percent moisture	5.16	(0)	[1]	18.8	(0)	[1]	20.4	(0)	[1]	18.6	(0)	[1]

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER	9 A1 KRF-A1-U2728 27 - 28			9 A2 KRF-A2-U0002 0 - 2			9 A2 KRF-A2-U0204 2 - 4			9 A2 KRF-A2-U0406 4 - 6		
418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
Hydrocarbons	2240	(52.6)	[2]	2330	(154)	[5]	203	(31.3)	[1]	1530	(30.6)	[1]
W8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(166)	[100]	ND	(1.94)	[1]	ND	(1.97)	[1]	ND	(1.93)	[1]
1,1,2,2-Tetrachloroethane	ND	(339)	[100]	ND	(5.26)	[1]	ND	(5.35)	[1]	ND	(5.25)	[1]
1,1,2-Trichloroethane	ND	(202)	[100]	ND	(1.58)	[1]	ND	(1.61)	[1]	ND	(1.58)	[1]
1,1-Dichloroethane	ND	(194)	[100]	ND	(1.78)	[1]	ND	(1.81)	[1]	ND	(1.77)	[1]
1,1-Dichloroethene	ND	(274)	[100]	ND	(2.66)	[1]	ND	(2.7)	[1]	ND	(2.66)	[1]
1,2-Dichloroethane	ND	(288)	[100]	ND	(1.8)	[1]	ND	(1.83)	[1]	ND	(1.8)	[1]
1,2-Dichloropropane	ND	(180)	[100]	ND	(2.72)	[1]	ND	(2.77)	[1]	ND	(2.72)	[1]
2-Chloroethyl vinyl ether	ND	(105)	[100]	ND	(2.97)	[1]	ND	(3.02)	[1]	ND	(2.96)	[1]
2-Hexanone	ND	(324)	[100]	ND	(0.995)	[1]	ND	(1.01)	[1]	ND	(0.992)	[1]
4-Methyl-2-Pentanone(MIBK)	ND	(280)	[100]	ND	(0.949)	[1]	ND	(0.965)	[1]	ND	(0.947)	[1]
Acetone	ND	(437)	[100]	7.63 B	(1.56)	[1]	12.3 B	(1.58)	[1]	7.79 B	(1.55)	[1]
Benzene	ND	(378)	[100]	< DL	(1.79)	[1]	< DL	(1.82)	[1]	< DL	(1.79)	[1]
Bromodichloromethane	ND	(240)	[100]	ND	(1.69)	[1]	ND	(1.72)	[1]	ND	(1.69)	[1]
Bromomethane	ND	(385)	[100]	ND	(2.09)	[1]	ND	(2.12)	[1]	ND	(2.08)	[1]
Carbon disulfide	ND	(355)	[100]	ND	(2.69)	[1]	ND	(2.73)	[1]	ND	(2.68)	[1]
Carbon tetrachloride	ND	(286)	[100]	ND	(2.07)	[1]	ND	(2.11)	[1]	ND	(2.07)	[1]
Chlorobenzene	9160	(229)	[100]	8.38	(4.82)	[1]	8.39	(4.9)	[1]	7.6	(4.81)	[1]
Chloroethane	ND	(344)	[100]	ND	(2.12)	[1]	ND	(2.16)	[1]	ND	(2.12)	[1]
Chloroform	ND	(152)	[100]	ND	(2.17)	[1]	ND	(2.21)	[1]	ND	(2.17)	[1]
Chloromethane	ND	(293)	[100]	ND	(2.53)	[1]	ND	(2.57)	[1]	ND	(2.52)	[1]
Dibromochloromethane	ND	(171)	[100]	ND	(1.9)	[1]	ND	(1.93)	[1]	ND	(1.9)	[1]
Ethyl benzene	< DL	(251)	[100]	ND	(1.72)	[1]	ND	(1.74)	[1]	ND	(1.71)	[1]
Methyl ethyl ketone	ND	(426)	[100]	13.7 B	(1.58)	[1]	13 B	(1.61)	[1]	12.8 B	(1.58)	[1]
Methylene Chloride	ND	(422)	[100]	< DL	(2.71)	[1]	2.82	(2.75)	[1]	4.01	(2.7)	[1]
Styrene	ND	(179)	[100]	ND	(1.68)	[1]	ND	(1.71)	[1]	ND	(1.68)	[1]
Tetrachloroethene	ND	(271)	[100]	ND	(4.93)	[1]	ND	(5.01)	[1]	ND	(4.92)	[1]
Toluene	< DL	(157)	[100]	2.12	(1.77)	[1]	2.09	(1.79)	[1]	2.66	(1.76)	[1]
Tribromomethane(Bromoform)	ND	(214)	[100]	ND	(1.57)	[1]	ND	(1.6)	[1]	ND	(1.57)	[1]
Trichloroethene	ND	(204)	[100]	ND	(5.04)	[1]	ND	(5.12)	[1]	ND	(5.03)	[1]
Vinyl Chloride	ND	(307)	[100]	ND	(2.15)	[1]	ND	(2.18)	[1]	ND	(2.14)	[1]
Vinyl acetate	ND	(124)	[100]	ND	(11.4)	[1]	ND	(11.6)	[1]	ND	(11.3)	[1]
Xylene (total)	667	(489)	[100]	ND	(3.78)	[1]	ND	(3.84)	[1]	ND	(3.77)	[1]
cis-1,3-Dichloropropene	ND	(186)	[100]	ND	(1.67)	[1]	ND	(1.69)	[1]	ND	(1.66)	[1]

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER	9 A1 KRF-A1-U0002 0 - 2			9 A1 KRF-A1-U1618 16 - 18			9 A1 KRF-A1-U1618D 16 - 18			9 A1 KRF-A1-U1820 18 - 20		
W8270 - Semivolatile Organics, cont. (ug/g)												
4-Chlorophenyl phenyl ether	ND	(0.0192)	[1]	NA			NA			ND	(0.573)	[1]
4-Methylphenol/3-Methylphenol	ND	(0.015)	[1]	NA			NA			0.922 F	(0.447)	[1]
4-Nitroaniline	ND	(0.0449)	[1]	NA			NA			ND	(1.34)	[1]
4-Nitrophenol	ND	(0.0477)	[1]	NA			NA			ND	(1.42)	[1]
Acenaphthene	0.0275	(0.0263)	[1]	NA			NA			ND	(0.784)	[1]
Acenaphthylene	ND	(0.0261)	[1]	NA			NA			ND	(0.776)	[1]
Anthracene	0.0405	(0.0314)	[1]	NA			NA			< DL	(0.935)	[1]
Benzo(a)anthracene	0.303	(0.0245)	[1]	NA			NA			< DL	(0.729)	[1]
Benzo(a)pyrene	0.295	(0.0327)	[1]	NA			NA			ND	(0.974)	[1]
Benzo(b)fluoranthene	0.621 F	(0.0432)	[1]	NA			NA			< DL	(1.29)	[1]
Benzo(g,h,i)perylene	0.169	(0.0465)	[1]	NA			NA			ND	(1.38)	[1]
Benzo(k)fluoranthene	0.621 F	(0.0453)	[1]	NA			NA			< DL	(1.35)	[1]
Benzoic acid	ND	(1.07)	[1]	NA			NA			ND	(32)	[1]
Benzyl alcohol	ND	(0.0221)	[1]	NA			NA			ND	(0.66)	[1]
Butylbenzylphthalate	ND	(0.075)	[1]	NA			NA			ND	(2.24)	[1]
Chrysene	0.355	(0.0408)	[1]	NA			NA			< DL	(1.21)	[1]
Di-n-octylphthalate	ND	(0.0212)	[1]	NA			NA			ND	(0.632)	[1]
Dibenz(a,h)anthracene	0.0563	(0.0412)	[1]	NA			NA			ND	(1.23)	[1]
Dibenzofuran	< DL	(0.0228)	[1]	NA			NA			ND	(0.679)	[1]
Dibutylphthalate	ND	(0.0203)	[1]	NA			NA			1.26	(0.606)	[1]
Diethylphthalate	ND	(0.0104)	[1]	NA			NA			ND	(0.311)	[1]
Dimethylphthalate	ND	(0.0184)	[1]	NA			NA			ND	(0.549)	[1]
Diphenylamine	ND	(0.037)	[1]	NA			NA			ND	(1.1)	[1]
Fluoranthene	0.679	(0.0243)	[1]	NA			NA			5.18	(0.723)	[1]
Fluorene	0.0231	(0.0189)	[1]	NA			NA			ND	(0.562)	[1]
Hexachlorobenzene	ND	(0.0227)	[1]	NA			NA			ND	(0.675)	[1]
Hexachlorobutadiene	ND	(0.0424)	[1]	NA			NA			ND	(1.26)	[1]
Hexachlorocyclopentadiene	ND	(0.0489)	[1]	NA			NA			ND	(1.46)	[1]
Hexachloroethane	ND	(0.0227)	[1]	NA			NA			ND	(0.677)	[1]
Indeno(1,2,3-cd)pyrene	0.146	(0.0363)	[1]	NA			NA			ND	(1.08)	[1]
Isophorone	ND	(0.0133)	[1]	NA			NA			ND	(0.396)	[1]
N-Nitroso-di-n-propylamine	ND	(0.0254)	[1]	NA			NA			ND	(0.756)	[1]
Naphthalene	ND	(0.0318)	[1]	NA			NA			9.45	(0.946)	[1]
Nitrobenzene	ND	(0.0181)	[1]	NA			NA			ND	(0.538)	[1]
Pentachlorophenol	ND	(0.0392)	[1]	NA			NA			ND	(1.17)	[1]
Phenanthrene	0.223	(0.0272)	[1]	NA			NA			3.07	(0.809)	[1]

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

TABLE A ALL RESULTS OF ORGANIC ANALYSES FOR SOIL SAMPLES, SITE '*', RF Heating, Kelly AFB.

PARAMETER	SITE ID LOCATION ID SAMPLE ID BEG. DEPTH - END DEPTH (FT.)											
	9 A1 KRF-A1-U0002 0 - 2			9 A1 KRF-A1-U1618 16 - 18			9 A1 KRF-A1-U1618D 16 - 18			9 A1 KRF-A1-U1820 18 - 20		
418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
Hydrocarbons	458	(30.6)	[1]	79700	(1650)	[50]	38900	(1480)	[50]	39300	(618)	[20]
8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(1.93)	[1]	NA			NA			ND	(1950)	[1000]
1,1,2,2-Tetrachloroethane	ND	(5.24)	[1]	NA			NA			ND	(3990)	[1000]
1,1,2-Trichloroethane	ND	(1.58)	[1]	NA			NA			ND	(2380)	[1000]
1,1-Dichloroethane	ND	(1.77)	[1]	NA			NA			ND	(2280)	[1000]
1,1-Dichloroethene	ND	(2.65)	[1]	NA			NA			ND	(3220)	[1000]
1,2-Dichloroethane	ND	(1.8)	[1]	NA			NA			ND	(3390)	[1000]
1,2-Dichloropropane	ND	(2.71)	[1]	NA			NA			ND	(2120)	[1000]
2-Chloroethyl vinyl ether	ND	(2.96)	[1]	NA			NA			ND	(1230)	[1000]
2-Hexanone	ND	(0.991)	[1]	NA			NA			ND	(3810)	[1000]
4-Methyl-2-Pentanone(MIBK)	ND	(0.946)	[1]	NA			NA			ND	(3300)	[1000]
Acetone	2.51 B	(1.55)	[1]	NA			NA			ND	(5150)	[1000]
Benzene	ND	(1.78)	[1]	NA			NA			< DL	(4440)	[1000]
Bromodichloromethane	ND	(1.69)	[1]	NA			NA			ND	(2830)	[1000]
Bromomethane	ND	(2.08)	[1]	NA			NA			ND	(4530)	[1000]
Carbon disulfide	ND	(2.68)	[1]	NA			NA			ND	(4170)	[1000]
Carbon tetrachloride	ND	(2.07)	[1]	NA			NA			ND	(3370)	[1000]
Chlorobenzene	< DL	(4.8)	[1]	NA			NA			96100	(2690)	[1000]
Chloroethane	ND	(2.11)	[1]	NA			NA			ND	(4050)	[1000]
Chloroform	ND	(2.16)	[1]	NA			NA			ND	(1790)	[1000]
Chloromethane	ND	(2.52)	[1]	NA			NA			ND	(3440)	[1000]
Dibromochloromethane	ND	(1.89)	[1]	NA			NA			ND	(2010)	[1000]
Ethyl benzene	ND	(1.71)	[1]	NA			NA			< DL	(2950)	[1000]
Methyl ethyl ketone	ND	(1.58)	[1]	NA			NA			ND	(5010)	[1000]

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

Science Applications International Corporation
An Employee-Owned Company

November 28, 1994

Clifton F. Blanchard
Brown & Root Environmental
Jackson Plaza, Suite A-600
800 Oak Ridge Turnpike
Oak Ridge, TN 37830

Re: EPA Contract No. 68-C0-0048, WA 0-49
SAIC Project No. 01-0832-07-1123-014

Dear Cliff:

Peggy Groeber asked me to send you the enclosed final pretreatment soil and water data from the KAI RFH demonstration.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Sharon Krietemeyer
Chemical Engineer

SMK/smk

Encl.

cc: M. Groeber (w/o enclosure)

smk:cliff.let

635 West Seventh Street, Suite 403, Cincinnati, Ohio 45203 • (513) 723-2600 • FAX: (513) 723-2605
Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/21/94	6/21/94	6/22/94	6/22/94	6/23/94	6/23/94	6/24/94
Time	8:56	17:43	8:28	16:14	7:48	18:42	19:10
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-6.0	-7.0	-6.0	-8.0	-7.0	-8.0	-6.0
E2	-7.0	-7.0	-6.0	-8.0	-7.0	-8.0	-6.0
E3	-7.0	-7.0	-6.0	-8.0	-7.0	-8.0	-7.0
E4	-0.8	-0.9	-0.9	-1.0	-0.9	-1.0	-0.9
E5	-0.7	-0.9	-0.9	-0.9	-0.8	-0.9	-1.0
E6	-0.8	-0.9	-0.8	-1.0	-0.9	-1.0	-0.4
E7	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6
E8	-0.8	-1.0	-1.1	-1.0	-0.9	-1.0	-1.1
HE	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-0.5	-0.7	-0.5	-0.7	-0.6	-0.6	-0.5
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TD6	-0.4	-0.6	-0.5	-0.6	-0.6	-0.7	-0.5
TD7	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
TD8	-0.1	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3
Suction	-11.0	-10.0	-12.0	-11.0	-12.0	-11.0	-12.0
Discharge	14.0	12.0	16.0	14.0	15.0	14.0	14.0
Compressor	387.5	387.5	387.5	387.5	387.5	415.2	387.5
Flare	11.1	11.1	11.1	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40
Flare	65	60	60	60	70	70	65

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	46.1	45.9	45.4	45.4	44.9	44.8	44.3
A2	74.1	73.3	71.5	71.3	69.3	68.3	67.1

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	28.0	33.5	27.6	34.0	25.4	29.4	?
E1	34.7	34.7	31.8	36.6	31.5	36.3	34.6
E2	40.8	39.8	37.6	40.5	37.0	39.5	39.5
E3	39.7	38.4	37.8	40.7	35.0	.9.3	38.6
E4	31.2	29.8	-	34.0	28.0	33.7	41.3
E5	32.0	32.1	-	35.4	-	33.8	33.9
E6	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-
E1,2,&3	33.4	36.1	32.3	37.1	30.8	35.4	35.2
E4&5	-	-	-	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-
Christmas Tree	31.1	33.3	32.2	33.3	28.3	37.2	32.8
Mixed Vapor	32.2	40.0	32.2	40.6	26.7	37.8	36.7

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/9/94	6/10/94	6/10/94	6/10/94	6/11/94	6/11/94	6/12/94	6/12/94	6/13/94	6/13/94	6/14/94	6/14/94
Time	17:52	17:57	10:54	17:57	9:01	17:23	8:37	21:29	8:00	19:22	9:10	17:49
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-0.5	-0.6	-0.6		-0.5	-0.6	-1.0	-0.8	-0.8	-0.9	-0.9	-0.8
E2	-1.3	-1.8	-1.9		-1.6	-1.8	-2.6	-2.4	-2.3	-2.4	-2.3	-2.5
E3	-1.4	-3.2	-3.3		-3.0	-3.3	-4.7	-4.2	-4.1	-4.3	-4.1	-4.4
E4	-6.0	-6.0	-6.0	-49.0	-5.0	-6.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
E5	-6.0	-6.0	-6.0	-72.1	-5.0	-6.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
E6	-1.0	-1.3	-1.3		-1.0	-1.1	-1.7	-1.6	-1.6	-1.6	-1.5	-1.7
E7	-1.0	-1.3	-1.3		-1.3	-1.2	-2.0	-1.8	-1.8	-1.9	-1.8	-2.1
E8	-0.4	-0.8	-0.5		-2.6	-3.0	-4.0	-4.4	-4.4	-4.5	-4.3	-4.6
HE	-0.5	-0.7	-0.7		-0.6	-0.7	-1.0	-0.9	-0.9	-0.9	-0.9	-0.7
TD1	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-0.1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-0.6	-1.3	-1.5		-1.0	-1.2	-1.8	-1.8	-1.7	-2.2	-1.5	-2.1
TD4	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.1	-0.4	-0.4		-0.3	-0.3	-0.4	-0.5	-0.7	-0.6	-0.6	-0.2
TD6	-0.6	-1.6	-1.3		-1.4	-1.3	-2.3	-2.2	-2.1	-2.3	-2.1	-2.7
TD7	-0.2	-0.2	-0.2		-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2
TD8	-0.4	-0.7	-0.7		-0.5	-0.6	-1.0	-0.9	-0.9	-0.9	-0.8	-1.0
Suction	-15.0	-16.0	-15.0		-16.0	-15.0	-19.0	-18.0	-19.0	-19.0	-18.0	-18.0
Discharge	20.0	19.0	19.0		20.0	19.0	25.0	24.0	24.0	24.0	24.0	24.0
Compressor	802.7	802.7	775.1		802.7	830.4	802.7	830.4	830.4	830.4	830.4	802.7
Flare	16.6	13.8	13.8		13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	50	50		50	50	50	50	50	55	50	55
Flare	95	90	90		90	90	95	90	105	105	105	100

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	64.9	59.6	60.4		60.0	58.8	60.0	58.6	57.5	56.6	54.7	54.2
A2	111.4	110.2	110.1		119.1	118.4	117.5	115.5	114.0	112.2	109.1	107.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	37.0	34.0	33.0		27.0	31.0	26.0	26.0	24.0	28.0	25.0	25.0
E1	-	-	-		-	-	-	-	-	-	-	-
E2	-	-	-		-	-	-	-	-	-	-	-
E3	-	-	-		-	-	-	-	-	-	-	-
E4	49.3	49.3	49.8		46.7	47.5	45.2	44.0	44.0	45.3	43.3	42.2
E5	75.2	73.9	73.1		63.3	63.9	61.6	59.0	57.3	58.4	54.1	51.8
E6	-	-	-		-	-	-	-	-	-	-	-
E7	-	-	-		-	-	-	-	-	-	-	-
E8	-	-	-		-	-	-	-	-	-	-	-
HE	-	-	-		-	-	-	-	-	-	-	-
E1,2,&3	-	-	-		-	-	-	-	-	-	-	-
E4&5	66.2	67.3	68.1		57.5	54.8	52.8	50.0	47.6	50.0	46.0	45.0
E6,7, &8	-	-	-		-	-	-	-	-	-	-	-
Christmas Tree	62.8	63.3	62.2		53.3	50.6	48.3	45.6	43.9	42.8	40.6	38.9
Mixed Vapor	54.4	51.7	51.7		40.6	40.6	40.6	37.8	35.0	36.7	33.3	29.4

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/27/94	5/28/94	5/28/94	5/29/94	5/29/94	5/30/94	5/30/94	5/31/94	6/1/94	6/1/94	6/2/94	6/3/94
Time	16:45	8:41	18:25	10:10	17:22	8:55	19:14	17:28	10:18	19:37		10:05
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-0.3	-0.4	-0.4	-0.5	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5		-0.6
E2	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0	-1.2	-1.3	-1.3	-1.3		-1.4
E3	-2.1	-1.9	-2.1	-2.3	-2.6	-2.1	-2.0	-1.6	-1.5	-1.5		-1.4
E4	-9.0	-9.0	-9.0	-8.5	-9.0	-8.0	-8.5	-7.5	-7.0	-7.0		-6.5
E5	-0.8	-9.5	-0.6	-11.5	-9.0	-7.5	-8.0	-7.5	-7.0	-7.2		-6.5
E6	-0.4	-0.6	-0.5	-0.8	-0.6	-0.6	-0.7	-0.8	-0.9	-1.1		-1.0
E7	-1.1	-1.3	-1.2	-1.2	-1.1	-1.0	-1.2	-1.0	-1.0	-1.1		-1.0
E8	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2		-0.2
HE	-8.5	-0.9	-1.1	-1.1	-0.7	-0.7	-0.7	-0.7	-0.6	-0.8		-0.6
TD1	0.0	> -0.1	0.0	> -0.1	0.0	>-0.1	0.0	0.0	0.0	>-0.1		0.0
TD2	0.0	> -0.1	0.0	> -0.1	0.0	>-0.1	0.0	>-0.1	>-0.1	>-0.1		0.0
TD3	-0.7	-0.8	-0.6	-0.7	-0.6	-0.7	-0.6	-0.8	-1.0	-0.7		-0.7
TD4	-0.1	> -0.1	0.0	> -0.1	0.0	>-0.1	0.0	>-0.1	0.0	0.0		0.0
TD5	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5	-0.2	-0.1	-0.2		-0.2
TD6	-1.9	-1.6	-1.6	-1.7	-1.6	-1.6	-1.6	-1.2	-0.3	-1.1		-0.9
TD7	> -0.1	-0.1	> -0.1	> -0.1	> -0.1	> -0.1	> -0.1	-0.1	-0.7	-0.2		-0.1
TD8	-0.5	-0.6	-0.5	-0.6	-0.6	-0.2	> -0.1	-0.5	-0.5	-0.8		-0.8
Suction	-18.0	-25.0	-25.0	-19.0	-18.0	-18.0	-24.0	-17.0	-24.0	-16.0		-17.0
Discharge	24.0	28.0	28.0	22.0	21.0	22.0	28.0	28.0	28.5	20.0		22.0
Compressor	719.7	692.0	719.7	3460.1	3487.8	3460.1	719.7	719.7	636.7	3487.8		3543.2
Flare	16.6	16.6	16.6	13.8	13.8	16.6	16.6	16.6	13.8	16.6		16.6

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	50	50	52	50	50	45	50	50	45		45
Flare	90	90	85	90	95	95	95	95	95	115		95

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1		143.4	147.1	142.3	146.3	144.3	143.4	148.2	135.5	129.1		
A2		95.7	92.3	87.6	85.6	81.6	88.3	108.9	107.1	86.4		

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	-	26.0	24.0	27.0	36.0	26.0	35.0	36.0	31.0	31.0		
E1	-	-	-	-	-	-	-	-	-	-		-
E2	-	-	-	-	-	-	-	-	-	-		-
E3	-	-	-	-	-	-	-	-	-	-		-
E4	92.5	92.3	90.6	89.3	89.5	90.6	80.8	67.8	62.5	65.0		58.6
E5	93.3	57.2	57.7	56.2	57.1	55.6	62.7	65.3	67.5	65.6		66.3
E6	-	-	-	-	-	-	-	-	-	-		-
E7	-	-	-	-	-	-	-	-	-	-		-
E8	-	-	-	-	-	-	-	-	-	-		-
HE	-	-	-	-	-	-	-	-	-	-		-
E1,2,&3	-	-	-	-	-	-	-	-	-	-		-
E4&5	26.0	65.3	66.4	66.7	66.7	67.5	65.9	68.8	68.8	65.0		66.3
E6,7, &8	-	-	-	-	-	-	-	-	-	-		-
Christmas Tree	60.0	60.0	61.7	61.7	63.3	62.2	63.9	65.6	64.4	60.0		63.3
Mixed Vapor	47.8	46.1	47.8	47.8	48.9	48.9	46.1	51.7	51.7	46.1		48.9

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/15/94	5/16/94	5/16/94	5/17/94	5/17/94	5/18/94	5/18/94	5/19/94	5/19/94	5/20/94	5/20/94	5/21/94
Time	19:30	8:01	16:21	7:23	16:25	7:48	16:53	17:34	8:55	8:07	15:50	7:28
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	0.0	-0.1	-0.4	-0.3	-0.6	-0.6	-0.8	-1.1	-1.5	-0.4	-0.4	-0.4
E2	-30.0	-22.0	-30.0	-23.0	-30.0	23.0	-24.0	-30.0	-30.0	-12.0	-1.5	-1.8
E3	-30.0	-22.0	-30.0	-23.0	-30.0	-25.0	-24.0	-30.0	-30.0	-9.0	-1.6	-1.8
E4	-0.5	-0.5	-1.9	-1.4	-2.5	-2.6	-3.0	-4.2	-4.5	-1.8	-1.4	-1.5
E5	+	+	-30.0	-23.0	-30.0	-25.0	-21.0	-30.0	-30.0	-11.0	-11.0	-11.0
E6	-0.5	-0.4	-1.5	-1.2	-2.2	-2.0	-2.4	-3.1	-3.3	-1.2	-1.1	-1.1
E7	-0.5	-0.3	-1.7	-1.2	-2.3	-2.3	-2.6	-3.6	-3.8	-1.3	-1.3	-1.5
E8	0.0	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.
HE	0.0	0.0	-0.2	-0.2	-0.4	-0.9	-1.3	-2.0	-2.1	-0.7	-0.8	-0.8
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
TD5	0.0	0.0	-0.2	-0.2	-0.3	-0.3	-1.0	-1.1	-1.0	-0.3	-0.2	-0.4
TD6	-0.1	-0.1	-1.8	-1.2	-2.3	-2.3	-3.0	-3.9	-4.2	-1.4	-1.5	-1.8
TD7	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	0.0	-0.1	-0.1
TD8	0.0	0.0	-0.4	-0.3	-0.8	-1.0	-1.2	-1.7	-1.8	-0.6	-0.6	-0.5
Suction	-46.0	-38.0	-47.0	-28.0	-42.0	-34.0	-33.0	-42.0	-43.0	-24.0	-22.0	-20.0
Discharge	50.0	39.0	50.0	30.0	43.0	36.0	35.0	-46.0	48.0	26.0	23.0	23.0
Compressor	387.5	249.1	1439.4	553.6	1245.6	1245.6	1079.6	1910.0	2048.4	581.3	553.6	664.3
Flare	11.1	8.3	13.8	22.1	22.1	22.1	8.3	22.1	16.6	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	35	60	45	55	60	50	70	60	40	40	50
Flare	60	60	95	70	85	90	110	130	140	90	85	85

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	23.0	23.3	23.1	23.7	23.8	23.9	24.0	24.5	24.5	24.4	24.3	110.1
A2	145.2	143.7	126.6	120.1	124.6	110.5	106.8	115.6	121.0	201.5	223.5	179.2

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	26.0	22.0	25.0	22.0	32.0	23.0	33.0	20.0	32.0	21.0	32.0	19.0
E1	-	-	-	-	-	-	-	-	-	21.1	-	19.8
E2	56.0	60.7	54.2	42.6	44.2	37.6	38.8	34.2	34.7	32.6	30.8	19.8
E3	25.1	27.0	28.8	23.5	41.7	26.7	43.5	27.0	45.3	27.3	34.4	22.6
E4	-	-	-	-	-	-	-	-	-	23.5	35.8	24.5
E5	-	-	87.0	85.4	82.6	78.2	74.3	74.5	75.7	74.4	86.6	86.6
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	32.8	39.5	47.7	35.6	44.2	34.5	39.1	30.1	37.5	28.6	44.7	23.9
E4&5	-	-	-	86.8	82.5	77.3	71.1	70.5	70.3	73.5	73.2	68.6
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	29.4	21.1	80.0	77.8	74.4	70.0	63.9	62.8	62.8	64.4	65.6	58.9
Mixed Vapor	28.3	20.0	61.7	63.3	63.3	52.8	51.7	48.9	51.7	47.8	51.7	43.3

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/3/94	5/4/94	5/4/94	5/5/94	5/5/94	5/6/94	5/6/94	5/7/94	5/7/94	5/8/94	5/8/94	5/9/94
Time	18:24	9:36	18:00	7:00	17:17	9:23	16:54	11:20	18:10	8:43	15:14	8:35
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	0.0	-0.4	-0.4	-0.4	-0.5	-0.3	-0.1	-0.4	-0.5	-0.5	-0.5	-0.4
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	0.1	-0.7	-0.7	-0.8	-0.9	-0.7	-0.9	-1.0	-1.3	-1.5	-1.7	-1.0
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-1.6	-1.3	-1.3	-1.3	-1.7	-1.2	-1.7	-1.4	-1.7	-1.6	-1.9	-1.5
E7	-1.4	-1.3	-1.3	-1.3	-1.5	-1.1	-1.4	-1.4	-1.7	-1.6	-1.9	-1.5
E8	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0
HE	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.3	-0.2
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-0.1	-1.0	-1.0	-0.9	-1.3	-0.9	-1.3	-1.0	-1.2	-0.1	0.0	0.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	-0.1	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
TD6	-0.5	-0.3	-0.4	-0.3	-0.5	-0.3	-0.4	-0.5	-0.8	-0.9	-1.1	-0.6
TD7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD8	-0.3	-0.2	-0.3	-0.3	-0.4	-0.3	-0.4	-0.3	-0.5	-0.5	-0.6	-0.4
Suction	-40.0	-38.0	-42.0	-38.0	-39.0	-38.0	-39.0	-36.0	-38.0	-36.0	-34.0	-34.0
Discharge	42.0	40.0	39.0	40.0	37.0	37.0	41.0	39.0	40.0	38.0	36.0	36.0
Compressor	415.2	415.2	442.9	415.2	442.9	415.2	442.9	415.2	442.9	387.5	415.2	415.2
Flare	11.1	11.1	11.1	11.1	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	60	60	60	60	60	60	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	18.3	18.6	18.8	18.6	18.9	19.1	18.9	19.3	19.3	19.7	19.7	19.8
A2	115.4	134.9	97.5	110.2	128.1	124.4	134.5	99.7	95.4	94.0	89.7	125.9

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	23.0	18.0	24.0	20.0	27.0	23.0	28.0	27.0	32.0	25.0	30.0	24.0
E1	-	-	-	-	-	-	-	-	-	-	-	-
E2	23.7	21.3	27.0	25.1	29.5	29.9	33.0	33.1	33.7	32.5	35.7	31.2
E3	-	-	-	-	-	-	-	-	-	-	-	-
E4	18.1	22.1	28.1	25.3	31.6	30.1	35.3	34.2	37.4	34.3	40.5	33.5
E5	90.6	93.5	86.3	91.2	85.6	82.6	85.5	77.2	72.3	64.3	63.5	89.5
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	26.7	22.6	27.8	24.6	30.7	29.8	33.7	33.7	34.3	31.5	36.6	30.9
E4&5	57.6	63.0	59.6	65.4	64.8	64.7	70.4	65.2	62.2	53.1	54.8	77.9
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	28.3	20.6	35.6	29.4	36.1	38.9	47.2	46.1	46.7	37.8	43.3	56.7
Mixed Vapor	23.3	15.6	26.1	18.9	40.6	23.9	34.4	32.2	35.0	27.2	35.0	35.0

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extraction System

Date	4/22/94	4/23/94	4/23/94	4/24/94	4/24/94	4/24/94	4/25/94	4/25/94	4/25/94	4/26/94	4/26/94	4/26/94
Time	14:41	14:02	9:23	8:12	14:00	20:04	8:00	13:24	18:35	8:03	12:54	16:50
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-1.0	-0.5	-0.5	-0.5	-1.0	-1.0	-1.0	-1.0	-0.5	-0.5	-1.0	-1.0
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-2.0	-1.0	-1.0	-1.0	-2.0	-1.5	-1.5	-2.0	-1.0	-1.5	-1.0	-1.0
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-3.0	-1.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
E7	-2.5	-1.5	-1.5	-2.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.5
E8	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.0
HE	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-2.0	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD6	-2.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-0.5	-1.0	-1.0
TD7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD8	-1.5	-0.5	-0.5	-1.0	-1.0	-0.5	-1.0	-1.0	-0.5	-0.5	-0.5	-0.5
Suction	-40.0	-42.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
Discharge	41.0	45.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	41.0	41.0
Compressor	664.3	442.9	442.9	470.6	470.6	470.6	442.9	442.9	442.9	442.9	442.9	442.9
Flare	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

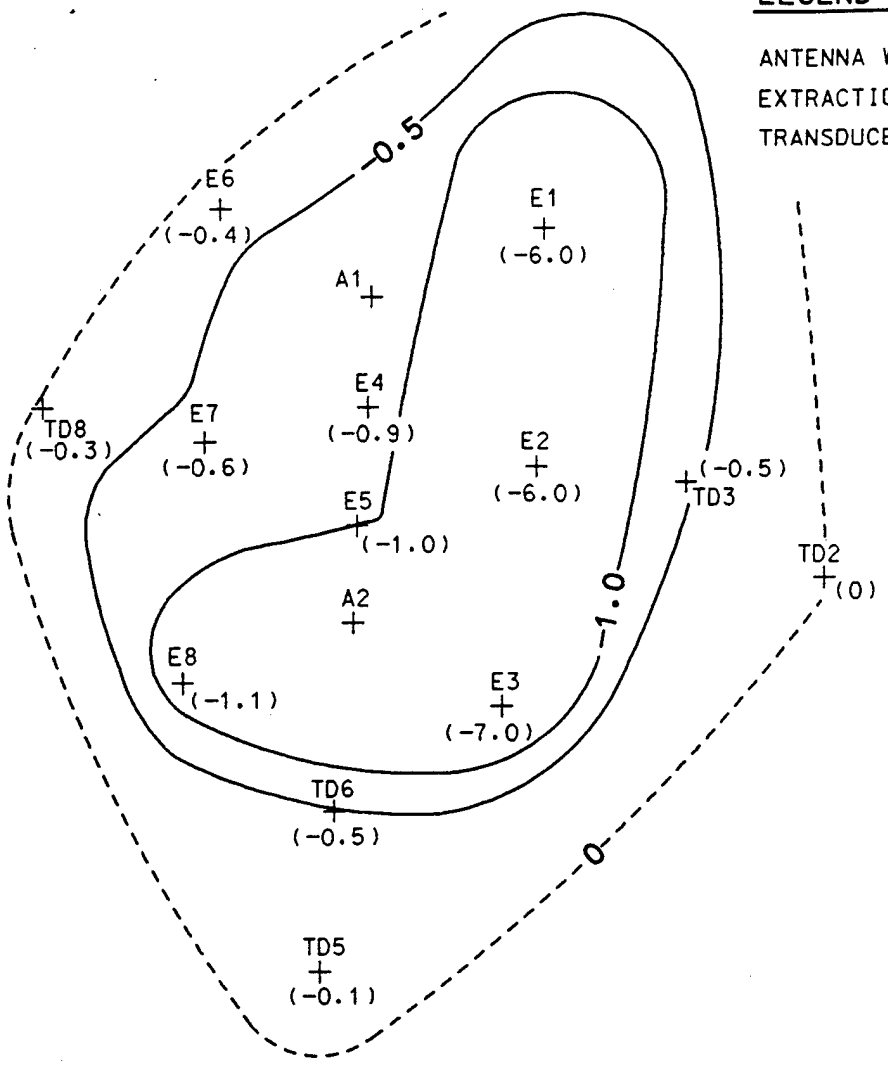
Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	50	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	50	60	60	60	60	60	60	60	60	60

Radio Frequency System

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	-	-	-	-	-	-	17.2	17.1	-	17.0	17.2	17.4
A2	-	-	-	-	-	-	95.1	95	-	95.0	113.5	95.7

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	30.6	27.8	23.4	19.4	27.1	26.8	22.1	26.0	30.0	23.0	31.0	33.0
E1	30.1	-	-	18.9	-	24.1	21.1	25.3	28.3	21.3	36.0	-
E2	29.3	29.1	22.3	21.8	28.1	26.5	22.8	25.6	28.5	23.2	31.1	31.5
E3	30.7	-	-	19.4	29.2	25.1	21.4	26.3	29.0	22.7	34.1	-
E4	29.4	27.9	21.9	21.7	27.3	26.8	22.9	25.7	29.0	23.3	32.3	32.8
E5	31.5	29.3	23.3	24.2	27.9	28.2	26.3	35.5	48.5	50.8	56.7	52.5
E6	31.7	-	-	19.5	-	24.3	21.8	23.7	25.7	21.7	-	-
E7	31.3	-	-	19.5	-	24.3	21.6	24.0	26.5	22.0	-	-
E8	31.4	-	-	19.7	-	25.0	21.9	25.1	28.3	23.1	-	-
HE	25.8	-	-	19.9	24.7	23.3	21.3	24.4	26.3	23.0	-	-
E1,2,&3	33.8	28.9	23.3	20.8	-	25.3	22.1	26.5	31.1	23.7	36.3	33.8
E4&5	31.9	27.9	22.1	21.6	-	25.2	23.1	27.0	32.7	31.4	39.3	38.0
E6,7, &8	33.4	-	-	19.1	-	25.6	21.6	26.1	29.7	23.1	-	-
Christmas Tree	36.1	28.3	23.3	18.9	27.8	28.9	22.2	26.7	33.9	23.3	32.2	37.8
Mixed Vapor	37.2	32.8	23.3	18.9	30.0	26.1	21.1	26.7	32.8	21.7	34.4	35.6



NOTES:

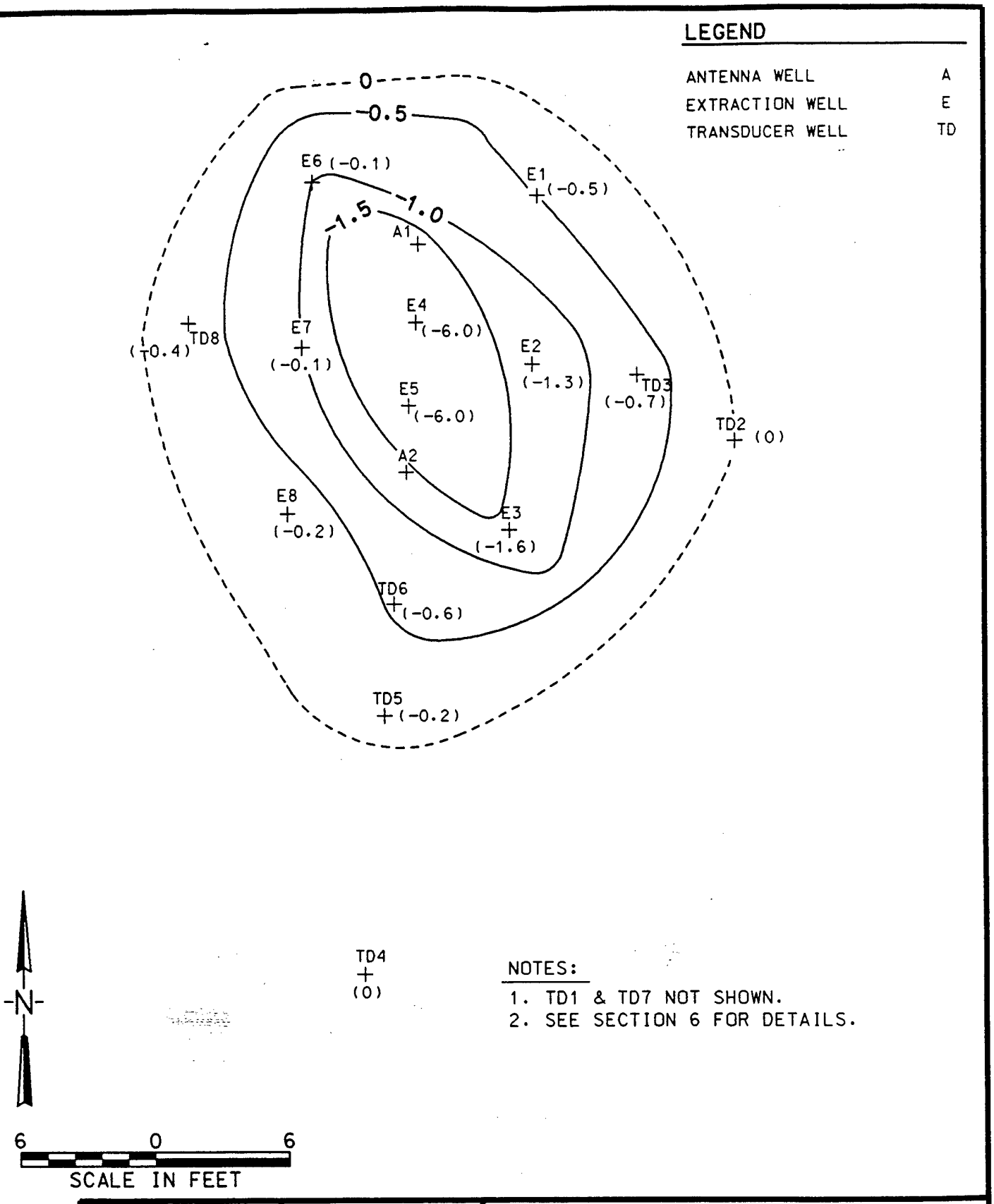
1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

N

6 0 6

SCALE IN FEET

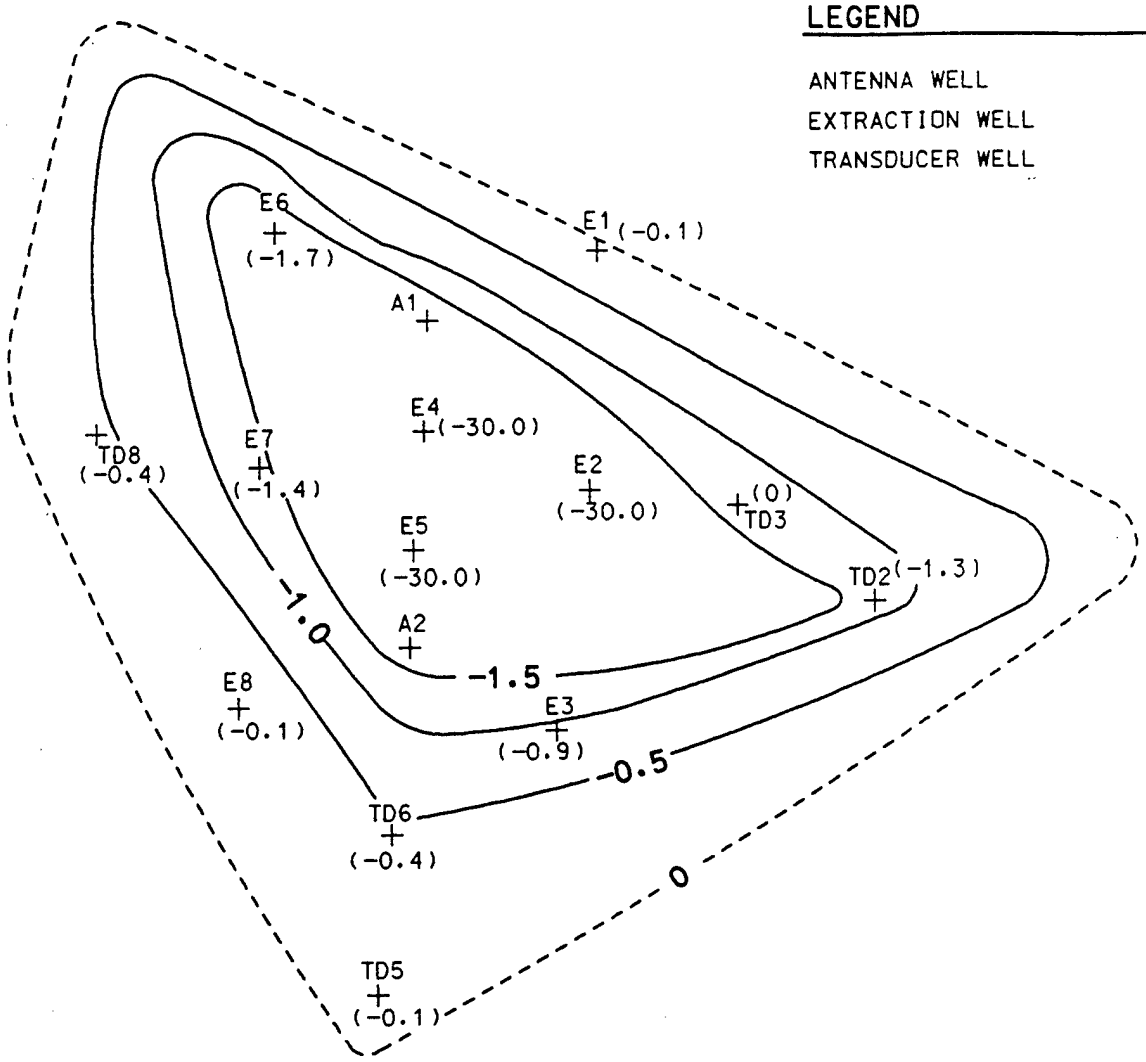
DRAWN	TITLE	SUBSURFACE PRESSURES FOR JUNE 24, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS
CHECKED		
GEOLOGIST		
ENGINEER		
DISC. MAN.	SCALE: AS SHOWN	DATE: 12-6-94
PROJ. MAN.	DRAWING NO.: 3688G016	REV.: 0 SHEET: 1 OF 1



NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

DRAWN	TITLE	SUBSURFACE PRESSURES FOR JUNE 7, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS
CHECKED		
GEOLOGIST		
ENGINEER		
DISC. MAN.	SCALE: AS SHOWN	DATE: 12-6-94
PROJ. MAN.	DRAWING NO.: 3688G016	REV.: 0
		SHEET: 1 OF 1



TD4 (0)

N

6 0 6

SCALE IN FEET

NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.
3. THE 0 VALUE AT TD3 WAS IGNORED FOR THESE CONTOURS.

DRAWN	
CHECKED	
GEOLOGIST	
ENGINEER	
DISC. MAN.	
PROJ. MAN.	

TITLE **SUBSURFACE PRESSURES FOR MAY 6, 1994**
KAI DEMONSTRATION
RADIO FREQUENCY HEATING
DECONTAMINATION DEMONSTRATION
SITE S-1
KELLY AIR FORCE BASE, TEXAS

SCALE	AS SHOWN	DATE	12-6-94
DRAWING NO.	3688G016	REV. 0	SHEET 1 OF 1

PERMEABILITY CALCULATIONS

Input data into Equation:

$$k = \frac{Q\,\mu\left[\ln\left(R_w / R_I\right)\right]}{H\,\pi P_w\left[1-\left(P_{ATM}/P_W\right)^2\right]}$$

$$k = \frac{(31.7\ ASCFM)(4.6\times10^{-7}\ lb\cdot s/ft^2)\left[\ln(0.167\ ft/9\ ft)\right]}{(27\ ft)\,\pi\,(1872\ lb/ft^2)\left[1-\left(\frac{2072\ lb/ft^2}{1872\ lb/ft^2}\right)^2\right]}\left(\frac{1\ min}{60\ s}\right)$$

k = 2.7E-11 ft²

Convert Vapor Permeability, k in ft² to cm²:

$$K = k\left(\frac{9.29\times10^{2}\ cm^2}{ft^2}\right)$$

$$K = 9.7\times10^{-11}\left(\frac{9.29\times10^{2}\ cm^2}{ft^2}\right)$$

k = 2.5E-08 cm²

Convert Vapor Permeability, k in ft² to darcy:

$$K = k\left(\frac{9.42\times10^{10}\ cm^2}{ft^2}\right)$$

$$K = 9.7\times10^{-11}\left(\frac{9.42\times10^{10}\ cm^2}{ft^2}\right)$$

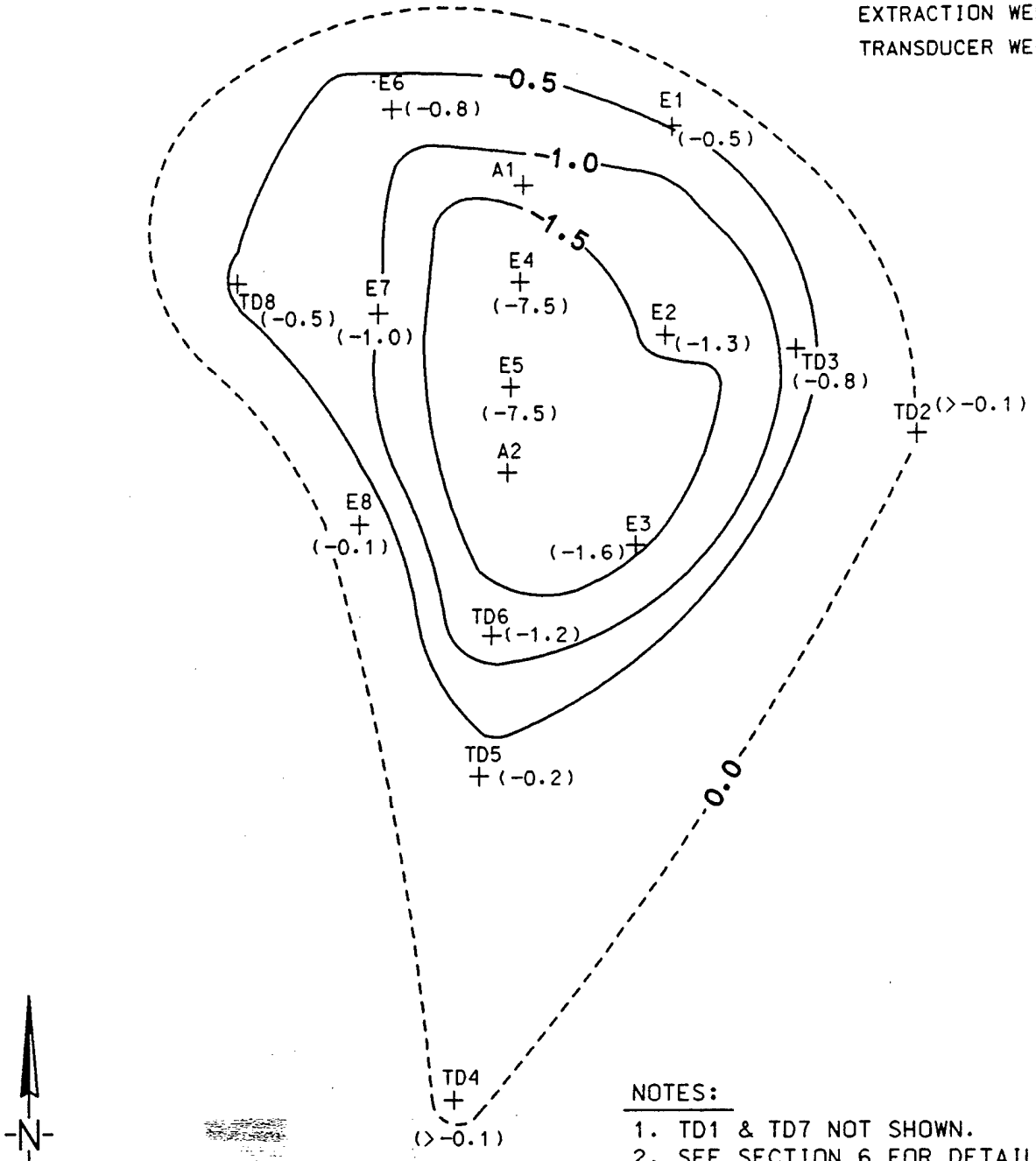
K = 2.6 darcy

Spreadsheet Calculation for Other Dates:

Data from Demonstration	4/8/94	5/6/94	5/31/94	6/7/94	6/14/94	6/24/94
Flow Rate, **Q**, (ASCFM)	54.0	31.7	71.4	66.2	75.7	47.5
Number of Wells	2	3	2	2	2	3
Well Radius, R_W, (ft.)	0.167	0.167	0.167	0.167	0.167	0.167
Total Screen Length, **H**, (ft.)	18	27	18	18	18	27
Differential Pressure at Wells, V, (in. H_2O)	-40	-38.5	-7.5	-6.0	-8.0	-6.33
Absolute Pressure at Wells, P_W, (lb/ft²)	1864	1872	2026	2020	2024	2025
Barometric Pressure (In. Hg)	29.3	29.3	29.2	29.0	29.2	29.1
Atmospheric Pressure, P_{ATM}, (lb/ft2)	2072	2072	2065	2051	2065	2058
Radius of Influence, R_I (ft.)	7	9	10	9	12	8
Vapor Temperature (°F)	105	126	157	157	100	116
Estimated Vapor Viscosity, μ (lb·s/ft²)	4.4E-07	4.6E-07	4.8E-07	4.8E-07	4.4E-07	4.5E-07
Estimated Vapor Permeability, **k**, (ft²)	6.4E-11	2.7E-11	5.1E-10	5.9E-10	4.7E-10	2.5E-10
Estimated Vapor Permeability, **k**, (cm²)	5.9E-08	2.5E-08	4.7E-07	5.5E-07	4.3E-07	2.3E-07
Estimated Vapor Permeability, **k**, (darcy)	6.0	2.6	48.2	55.9	43.8	23.7

LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



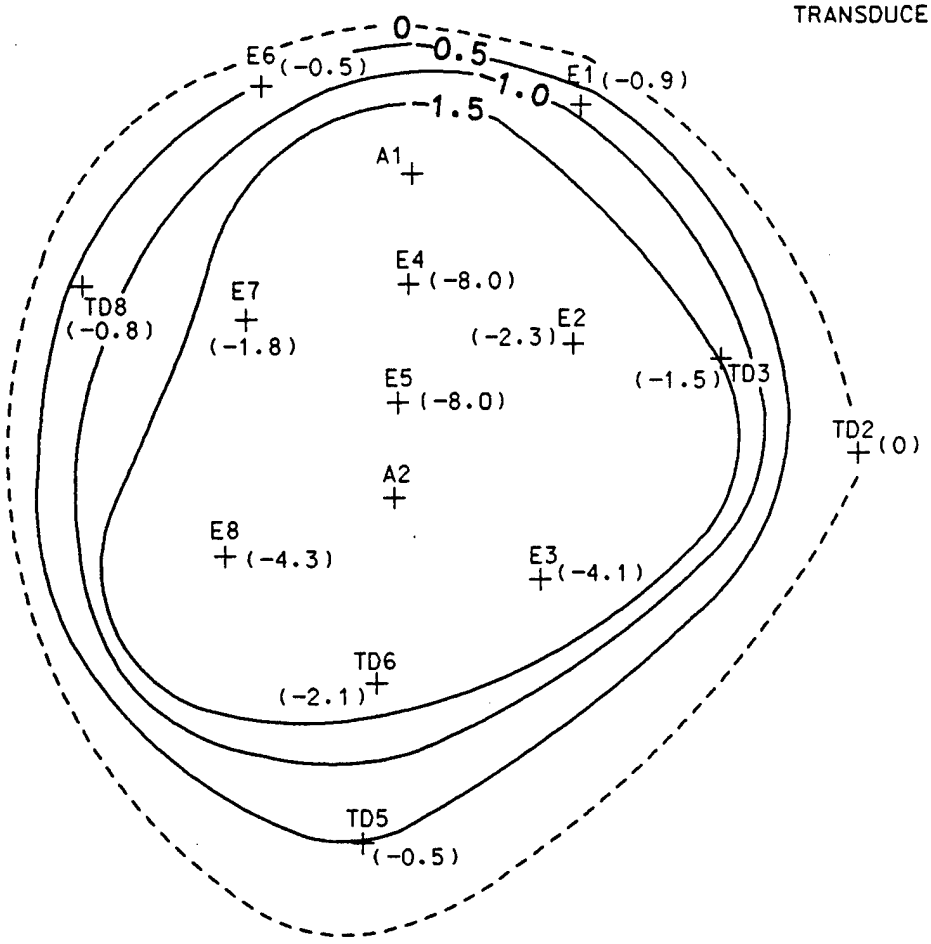
NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

DRAWN	TITLE	SUBSURFACE PRESSURES FOR MAY 31, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS
CHECKED		
GEOLOGIST		
ENGINEER		
DISC. MAN.	SCALE: AS SHOWN	DATE: 12-6-94
PROJ. MAN.	DRAWING NO.: 3688G016	REV.: 0
		SHEET: 1 OF 1

LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

N

6 0 6

SCALE IN FEET

DRAWN	TITLE	SUBSURFACE PRESSURES FOR JUNE 14, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS
CHECKED		
GEOLOGIST		
ENGINEER		
DISC. MAN.	SCALE: AS SHOWN	DATE: 12-6-94
PROJ. MAN.	DRAWING NO.: 3688G016	REV.: 0 SHEET: 1 OF 1

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	4/27/94	4/27/94	4/27/94	4/28/94	4/28/94	4/29/94	4/29/94	4/30/94	5/1/94	5/2/94	5/2/94	5/3/94
Time	8:18	13:29	17:12	7:57	15:52	11:20	17:34	18:44	10:52	12:17	19:10	14:00
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-0.5	-0.7	-0.6	-0.5	0.0	0.0	-0.5	-0.7	-0.4	-0.3	-0.3	-0.4
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-1.0	-1.8	-1.4	-1.3	-1.3	-2.1	-1.3	-2.0	-1.3	-1.3	-0.9	-0.9
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-2.0	-2.3	-2.2	-2.0	-1.5	-2.3	-1.6	-2.3	-1.4	-1.5	-1.3	-1.5
E7	-1.0	0.0	-2.3	-2.0	-2.3	-2.7	0.0	-2.5	-1.8	-1.7	-1.3	-1.4
E8	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
HE	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+	0.0	0.0	0.0	-0.1
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+	0.0
TD2	-1.0	-1.7	-1.4	-0.1	-1.3	-2.7	-1.2	-1.7	-1.2	-1.0	-0.9	-1.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TD6	-0.5	-1.0	-0.7	-0.7	-0.9	-1.1	-0.9	-1.3	-0.9	-0.8	-0.6	-0.5
TD7	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3
TD8	-0.5	-0.7	-0.6	-0.5	-0.5	-0.5	-0.4	-0.6	-0.4	-0.3	-0.3	0.0
Suction	-43.0	-41.0	-40.0	-41.0	-46.0	-46.0	-39.0	-38.0	-39.0	-45.0	-33.0	-40.0
Discharge	45.0	43.0	43.0	43.0	48.0	48.0	38.0	39.0	41.0	48.0	35.0	43.0
Compressor	498.3	498.3	498.3	470.6	498.3	498.3	415.2	415.2	415.2	415.2	276.8	415.2
Flare	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	60	60	60	60	60	60	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	17.1	17.1	17.3	17.1	17.2	17.5	17.5	17.7	17.5	18.0	18.1	18.2
A2	114.0	105.6	109.4	102.8	107.0	104.6	96.5	72.4	69.4	99.5	95.1	104.4

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	24.0	29.0	30.0	24.0	25.0	23.0	21.0	18.0	14.0	21.0	21.0	28.0
E1	-	27.5	-	-	-	-	-	-	-	-	-	-
E2	24.1	28.1	29.0	23.4	24.0	26.4	29.0	23.6	20.1	21.1	22.6	28.5
E3	-	28.6	-	-	-	29.8	-	-	-	-	-	-
E4	24.7	28.8	30.0	24.6	23.5	26.0	28.5	23.4	20.2	21.0	20.1	29.7
E5	56.7	51.6	58.3	56.5	56.4	64.6	62.1	37.2	36.8	62.3	40.7	92.1
E6	-	27.7	-	-	-	-	-	-	-	-	-	-
E7	-	28.6	-	-	-	-	-	-	-	-	-	-
E8	-	28.6	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	24.8	30.8	30.5	24.6	25.0	27.8	29.7	20.1	18.0	21.0	21.4	33.8
E4&5	36.3	36.2	40.1	37.3	31.7	43.2	42.6	22.8	21.7	29.5	22.8	59.5
E6,7, &8	-	30.7	-	-	-	-	-	-	-	-	-	-
Christmas Tree	25.0	31.1	31.1	25.0	26.1	30.0	33.3	19.4	13.3	18.9	23.3	35.0
Mixed Vapor	23.3	15.6	30.0	22.8	26.7	26.7	32.2	18.3	13.3	19.4	21.1	31.1

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/9/94	5/10/94	5/10/94	5/11/94	5/11/94	5/12/94	5/12/94	5/13/94	5/13/94	5/14/94	5/14/94	5/15/94
Time	17:40	8:35	16:25	10:04	17:11	7:41	16:45	7:33	18:08	7:56	18:17	10:52
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.8	-0.7	-0.7	-0.1	-0.2	-0.1	-0.1
E2	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E4	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-0.5	-1.0	-0.5	-0.4
E5	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-0.5	0.0	-0.5	+
E6	-1.8	-1.8	-1.9	-2.1	-1.7	-2.5	-2.5	-2.3	-0.5	-0.8	-0.5	-0.5
E7	-1.7	-1.7	-1.9	-2.2	-1.7	-2.5	-2.5	-2.4	-0.5	-0.6	-0.5	-0.3
E8	0.0	0.0	0.0	-0.1	0.0	-0.1	atm.	atm.	atm.	0.0	atm.	atm.
HE	-0.2	-0.1	-0.1	-0.3	-0.3	-0.7	-0.7	-0.8	+	0.0	0.0	+
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	0.0	0.0	0.0	-0.3	-0.1	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	-0.8	-0.3	-0.1	-0.1	0.0	-0.1
TD6	-0.9	-0.9	-1.0	-1.6	-1.0	-1.7	-1.7	-1.8	-0.4	-0.3	-0.1	0.0
TD7	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
TD8	-0.5	-0.5	-0.5	-0.8	-0.5	-1.0	-1.0	-0.9	-0.2	-0.2	0.0	0.0
Suction	-36.0	-36.0	-38.0	-37.0	-31.0	-40.0	-38.0	-34.0	-45.0	-45.0	-45.0	-45.0
Discharge	38.0	34.0	39.0	38.0	33.0	42.0	40.0	36.0	48.0	48.0	48.0	49.0
Compressor	470.6	498.3	525.9	609.0	470.6	1024.2	996.5	1190.3	387.5	387.5	387.5	387.5
Flare	13.8	16.6	13.8	16.6	13.8	19.4	19.4	19.4	13.8	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	45	45	45	45	40	50	60	40	40	40	45
Flare	60	65	65	65	65	80	85	85	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	19.9	20.1	20.3	20.5	20.6	21.0	20.9	21.3	21.4	22.1	21.8	22.5
A2	130.3	134.1	139.4	115.6	137.0	128.1	126.4	121.5	116.8	142.4	137.8	143.4

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	30.0	24.0	30.0	24.0	28.0	23.0	28.1	23.1	19.0	30.0	17.0	30.0
E1	-	-	-	-	-	-	-	-	-	-	-	-
E2	34.3	31.8	34.0	31.7	33.1	29.4	32.0	30.1	27.1	43.3	28.4	47.6
E3	34.3	26.3	34.3	27.4	30.7	25.2	33.7	25.8	24.6	30.6	20.3	29.6
E4	38.7	33.8	37.5	35.3	35.3	34.2	37.8	33.5	-	-	-	-
E5	88.3	88.5	88.5	72.7	84.2	75.5	77.3	76.8	-	-	-	-
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	35.0	30.1	35.6	31.1	32.7	29.0	32.1	29.0	23.7	36.9	21.8	36.0
E4&5	78.7	79.6	80.6	66.1	78.1	71.3	73.3	73.3	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	61.1	62.2	63.9	48.9	62.2	58.3	62.2	62.2	19.4	35.0	16.7	26.7
Mixed Vapor	44.4	42.2	46.1	32.2	44.4	40.6	46.1	45.6	18.3	37.8	18.3	35.0

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/21/94	5/22/94	5/22/94	5/23/94	5/23/94	5/24/94	5/24/94	5/25/94	5/25/94	5/26/94	5/26/94	5/27/94
Time	18:03	8:56	17:43	8:30	18:41	9:13	16:44	9:54	16:14	8:06	17:52	
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-0.4	-0.3	-17.0	-13.0	-0.3	-0.3	-0.2	-0.2	-0.3	-	-	
E2	-1.8	-1.3	-17.0	-13.0	-1.3	-1.1	-0.9	-0.9	-0.7	-	-	
E3	-1.8	-1.3	-18.0	-13.0	-2.5	-2.2	-2.0	-2.0	-1.6	-	-	
E4	-1.8	-1.1	-14.0	-13.0	-11.0	-10.0	-9.0	-9.0	-7.0	-12.0	-10.5	
E5	-12.0	-10.0	-14.0	-13.0	-11.0	-11.0	-8.5	-8.5	-6.5	-10.5	-10.0	
E6	-0.9	-0.6	atm.	-2.0	-0.7	-0.5	-0.7	-0.5	-0.3	-	-	
E7	-1.6	-1.4	atm.	-2.2	-1.5	-0.9	-1.4	-1.1	-0.9	-	-	
E8	atm.	atm.	atm.	-0.5	-0.3	-0.2	-0.3	-0.2	-0.2	-	-	
HE	-1.0	-0.9	1.5	-1.4	-1.2	-0.9	-0.9	-0.1	-0.7	-1.0	-0.9	
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	> -0.1	0.0	0.0	> -0.1	
TD3	0.0	0.0	-1.0	-1.0	-0.7	-0.7	-0.6	-0.4	-0.5	-0.1	-0.7	
TD4	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	
TD5	-0.4	-0.3	-0.7	-0.7	-0.6	-0.5	-0.3	-0.3	-0.2	> -0.1	-0.3	
TD6	-2.0	-1.7	-2.9	-2.7	-2.1	-2.4	-1.8	-1.7	-1.3	> -0.1	-1.2	
TD7	0.0	-0.1	-0.1	-0.1	0.0	-0.6	-	-0.1	-0.1	-0.3	> -0.1	
TD8	-0.7	-0.6	-1.3	-1.1	-0.8	0.0	-	-0.6	-0.4	-0.8	-0.6	
Suction	-20.0	-21.0	-26.0	-27.0	-23.0	-21.0	-21.0	-19.0	-16.0	-21.0	-20.0	
Discharge	23.0	22.0	34.0	-33.0	28.0	23.0	21.0	22.0	19.0	24.0	24.0	
Compressor	692.0	636.7	1439.4	1218.0	885.8	747.4	636.7	609.0	498.3	650.5	650.5	
Flare	13.8	13.8	16.6	13.8	16.6	16.6	13.8	16.6	13.8	13.8	13.8	

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	53	50	60	52	50	55	50	50	45	50	50	
Flare	85	85	125	120	90	85	95	90	95	85	95	

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	117.5	119.2	122.9	122.4	130.4	133.2	138.6	135.8	139.2	139.2	142.7	
A2	171.1	136.2	127.3	181.9	180.7	168.1	159.2	142.5	136.2	123.3	116.1	

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	29.0	24.0	29.0	22.0	29.1	30.6	33.3	32.0	32.0	26.0	33.3	
E1	30.9	25.0	29.6	26.8	-	-	-	-	-	-	-	
E2	30.3	31.1	58.0	58.6	-	31.4	-	-	-	-	-	
E3	30.8	31.8	40.0	29.3	-	-	-	-	-	-	-	
E4	36.9	25.6	69.0	70.7	83.1	88.2	89.9	91.6	91.5	92.5	93.5	
E5	89.6	78.0	79.3	70.1	70.3	65.2	64.8	59.8	58.7	58.5	59.1	
E6	-	-	-	-	-	-	-	-	-	-	-	
E7	-	-	-	-	-	-	-	-	-	-	-	
E8	-	-	-	-	-	-	-	-	-	-	-	
HE	-	-	-	-	-	30.0	-	-	-	-	-	
E1,2,&3	34.0	28.7	35.0	30.3	-	-	-	-	-	-	-	
E4&5	72.8	64.8	67.3	58.8	62.7	64.6	63.4	63.2	62.5	64.8	65.9	
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	
Christmas Tree	57.8	56.7	56.7	44.4	57.2	56.7	58.9	57.8	58.3	58.3	61.1	
Mixed Vapor	45.0	43.3	43.3	37.2	45.0	46.1	46.7	46.1	46.1	42.8	46.1	

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/3/94	6/4/94	6/4/94	6/5/94	6/5/94	6/6/94	6/6/94	6/7/94	6/7/94	6/8/94	6/8/94	6/9/94
Time	16:20	08:52	20:58	9:05	17:55	9:10	18:10	9:22	16:54	10:08	17:58	9:19
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-0.6	-0.6		-0.6	-0.6	-0.5	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5
E2	-1.7	-1.5		-1.6	-1.4	-1.5	-1.5	-1.3	-1.5	-1.7	-1.4	-1.4
E3	-1.6	-1.4		-1.4	-1.5	-1.4	-1.4	-1.4	-1.5	-1.3	-1.4	-1.4
E4	-7.0	-6.5		-6.0	-6.0	-7.5	-6.0	-6.0	-6.0	-7.0	-6.0	-5.5
E5	-8.0	-6.5		-7.0	-6.0	-6.0	-6.0	-6.0	-6.5	-5.5	-6.0	-5.5
E6	-1.1	-1.1		-1.0	-1.0	-1.0	-1.0	-1.0	-1.1	-1.0	-1.1	-1.0
E7	-1.0	-1.2		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
E8	-0.2	-0.2		-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3
HE	-0.6	-0.6		-0.7	-0.6	-0.5	-0.6	-0.5	-0.6	-0.5	-0.5	-0.5
TD1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	>-0.1	>-0.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
TD3	-0.8	-1.0		-0.8	-0.9	-0.7	-1.0	-0.7	-0.5	-0.7	-0.6	-0.7
TD4	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.1	>-0.1		-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2
TD6	-0.9	-0.5		-0.6	-0.6	-0.6	-0.7	-0.6	-0.5	-0.4	-0.5	-0.7
TD7	-0.1	> -0.1		-0.1	-0.2	> -0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1
TD8	-0.5	-0.7		-0.5	-0.6	-0.5	-0.5	-0.4	-0.5	-0.5	-0.5	>-0.1
Suction	-18.0	-20.0		-27.0	-17.0	-16.0	-17.0	-23.0	-17.0	-16.0	-16.0	-15.0
Discharge	22.0	26.0		21.0	21.0	20.0	21.0	27.0	21.0	20.0	-21.0	18.0
Compressor	3543.2	802.7		775.1	830.4	775.1	802.7	802.7	830.4	775.1	830.4	775.1
Flare	16.6	16.6		16.6	13.8	16.6	16.6	16.6	13.8	16.6	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	45		50	45	45	45	45	45	50	50	50
Flare	95	95		95	95	95	95	85	95	95	95	95

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	106.0	99.3		90.9	88.5	83.9	82.3	74.4	73.7	69.9	68.6	66.1
A2	116.6	115.9		123.5	130.3	135.5	135.4	117.2	113.7	107.0	110.9	103.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	33.0	25.0		26.0	35.0	30.0	35.0	31.0	37.0	32.0	37.0	29.0
E1	-	-		-	-	-	-	-	-	-	-	-
E2	-	-		-	-	-	-	-	-	-	-	-
E3	-	-		-	-	-	-	-	-	-	-	-
E4	57.7	55.0		52.5	54.1	51.2	51.7	49.4	50.5	50.0	50.2	48.0
E5	68.4	67.6		71.2	73.6	71.7	76.8	71.3	77.3	74.2	76.8	70.5
E6	-	-		-	-	-	-	-	-	-	-	-
E7	-	-		-	-	-	-	-	-	-	-	-
E8	-	-		-	-	-	-	-	-	-	-	-
HE	-	-		-	-	-	-	-	-	-	-	-
E1,2,&3	-	-		-	-	-	-	-	-	-	-	-
E4&5	61.3	65.1		67.7	68.1	66.7	66.9	64.9	67.2	66.7	66.6	66.2
E6,7, &8	-	-		-	-	-	-	-	-	-	-	-
Christmas Tree	62.8	62.8		69.4	65.6	65.6	62.8	62.8	63.9	62.8	62.8	62.8
Mixed Vapor	51.7	57.2		51.7	54.4	51.7	48.9	51.7	57.2	54.4	51.7	51.7

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/15/94	6/15/94	6/16/94	6/16/94	6/17/94	6/17/94	6/18/94	6/18/94	6/19/94	6/19/94	6/20/94	6/20/94
Time	8:52	19:14	0:00	17:20	7:19	18:12	7:27	18:29	8:37	16:34	8:25	16:31
Well Number	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)	Pressure (" H2O)
E1	-8.0	-12.0	-7.0	-11.0	-7.0	-9.0	-6.0	-11.0	-5.0	-7.0	-6.0	-7.0
E2	-8.0	-12.0	-7.0	-12.0	-7.0	-10.0	-6.0	-12.0	-5.0	-7.0	-6.0	-7.0
E3	-8.0	-12.0	-7.0	-12.0	-7.0	-10.0	-6.0	-12.0	-7.0	-7.0	-6.0	-7.0
E4	-1.4	-2.2	-1.3	-1.8	-1.2	-1.4	-1.1	-1.6	-0.8	-0.9	-1.0	-0.9
E5	-1.5	-2.2	-1.4	-1.8	-1.2	-1.4	-1.1	-1.6	-1.0	-0.8	-1.0	-0.9
E6	-1.0	-2.0	-1.5	-1.7	-1.2	-1.4	-1.0	-1.6	-1.0	-0.9	-0.9	-1.0
E7	-1.0	-1.5	-1.3	-1.2	-0.8	-1.0	-0.7	-1.0	-0.7	-0.6	-0.7	-0.6
E8	-1.0	-2.6	0.0	-2.0	-1.4	-1.5	-1.3	-1.8	-1.3	-0.9	-1.0	-1.0
HE	-0.3	-0.5	0.0	-0.5	-0.3	-0.3	-0.2	0.4	-0.2	-0.2	-0.2	-0.2
TD1	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-1.5	-1.7	-1.0	-1.3	-0.8	-1.0	-0.8	-1.2	-0.8	-0.7	-0.3	-0.6
TD4	0.0	0.0	>-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.4	-0.5	-0.5	-0.4	-0.3	-0.3	-0.2	-0.3	-0.2	-0.4	0.0	0.1
TD6	-1.9	-1.6	-1.3	-1.5	-1.1	-1.0	-0.9	-1.3	-0.9	-0.6	-0.1	-0.5
TD7	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2
TD8	-0.7	-0.8	-0.6	-0.6	-0.4	-0.5	-0.3	-0.6	-0.4	-0.3	-0.3	-0.2
Suction	-17.0	-17.0	-16.0	-16.0	-15.0	-14.0	-13.0	-17.0	-9.0	-9.0	-12.0	-10.0
Discharge	21.0	23.0	24.0	21.0	19.0	18.0	17.0	22.0	12.0	13.0	16.0	13.0
Compressor	747.4	747.4	609.0	581.3	581.3	581.3	747.4	498.3	304.5	387.5	387.5	387.5
Flare	13.8	13.8	13.8	13.8	11.1	11.1	8.3	8.3	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	50	50	50	45	50	50	50	50	40	40	40	60
Flare	85	100	80	85	75	80	75	85	70	70	70	65

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	53.8	52.2	51.4	51.3	50.2	49.6	49.0	48.8	48.0	47.6	46.9	46.7
A2	101.5	99.9	96.1	93.7	89.8	87.6	84.6	83.3	80.6	79.5	77.1	76.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	26.0	25.0	25.0	32.0	24.0	35.0	25.0	35.0	27.0	26.0	27.0	34.0
E1	30.2	31.4	29.7	34.8	30.5	36.6	31.6	36.4	33.1	34.2	31.1	36.4
E2	39.7	39.8	39.3	42.7	38.4	42.4	38.7	41.8	38.7	39.9	37.8	41.4
E3	40.8	41.5	39.8	42.4	39.1	42.5	39.2	42.8	39.3	38.2	38.1	41.0
E4	33.5	36.0	33.8	43.6	36.1	43.2	31.8	46.1	34.5	36.0	29.6	-
E5	37.5	40.1	33.6	40.0	35.6	42.0	34.2	42.0	35.7	38.3	32.5	-
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	32.1	33.2	31.8	36.7	32.1	38.8	32.7	38.6	33.3	31.6	32.3	38.1
E4&5	-	-	-	-	-	-	-	-	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	31.1	25.6	30.0	36.1	30.0	38.3	30.0	38.3	30.6	29.4	30.6	34.4
Mixed Vapor	26.7	26.1	25.6	38.3	25.6	41.7	26.7	41.1	29.4	26.7	29.4	40.6

PARAMETER	9 A1 KRF-A1-U0002 0 - 2			9 A1 KRF-A1-U1618 16 - 18		9 A1 KRF-A1-U1618D 16 - 18		9 A1 KRF-A1-U1820 18 - 20		
W8240 - Volatile Organics, cont. (ug/kg)										
Methylene Chloride	6.23	B (2.7)	[1]	NA		NA		ND	(4960)	[1000]
Styrene	ND	(1.67)	[1]	NA		NA		ND	(2110)	[1000]
Tetrachloroethene	ND	(4.91)	[1]	NA		NA		ND	(3180)	[1000]
Toluene	ND	(1.76)	[1]	NA		NA		3400	(1850)	[1000]
Tribromomethane(Bromoform)	ND	(1.56)	[1]	NA		NA		ND	(2520)	[1000]
Trichloroethene	ND	(5.02)	[1]	NA		NA		ND	(2390)	[1000]
Vinyl Chloride	ND	(2.14)	[1]	NA		NA		ND	(3620)	[1000]
Vinyl acetate	ND	(11.3)	[1]	NA		NA		ND	(1460)	[1000]
Xylene (total)	ND	(3.76)	[1]	NA		NA		< DL	(5750)	[1000]
cis-1,3-Dichloropropene	ND	(1.66)	[1]	NA		NA		ND	(2180)	[1000]
trans-1,2-Dichloroethene	ND	(2.41)	[1]	NA		NA		ND	(2100)	[1000]
trans-1,3-Dichloropropene	ND	(1.8)	[1]	NA		NA		ND	(2340)	[1000]
W8270 - Semivolatile Organics (ug/g)										
1,2,4-Trichlorobenzene	ND	(0.0181)	[1]	NA		NA		ND	(0.539)	[1]
1,2-Dichlorobenzene	ND	(0.0253)	[1]	NA		NA		8.87	(0.753)	[1]
1,3-Dichlorobenzene	ND	(0.023)	[1]	NA		NA		1.73	(0.685)	[1]
1,4-Dichlorobenzene	ND	(0.0301)	[1]	NA		NA		6.79	(0.897)	[1]
2,4,5-Trichlorophenol	ND	(0.0226)	[1]	NA		NA		ND	(0.674)	[1]
2,4,6-Trichlorophenol	ND	(0.027)	[1]	NA		NA		ND	(0.803)	[1]
2,4-Dichlorophenol	ND	(0.0358)	[1]	NA		NA		ND	(1.07)	[1]
2,4-Dimethylphenol	ND	(0.0332)	[1]	NA		NA		ND	(0.989)	[1]
2,4-Dinitrophenol	ND	(0.0461)	[1]	NA		NA		ND	(1.37)	[1]
2,4-Dinitrotoluene	ND	(0.0281)	[1]	NA		NA		ND	(0.838)	[1]
2,6-Dinitrotoluene	ND	(0.0307)	[1]	NA		NA		ND	(0.914)	[1]
2-Chloronaphthalene	ND	(0.027)	[1]	NA		NA		ND	(0.805)	[1]
2-Chlorophenol	ND	(0.0233)	[1]	NA		NA		ND	(0.694)	[1]
2-Methylnaphthalene	ND	(0.0239)	[1]	NA		NA		20.7	(0.712)	[1]
2-Methylphenol	ND	(0.0129)	[1]	NA		NA		ND	(0.385)	[1]
2-Nitroaniline	ND	(0.0304)	[1]	NA		NA		ND	(0.905)	[1]
2-Nitrophenol	ND	(0.0305)	[1]	NA		NA		ND	(0.909)	[1]
3,3'-Dichlorobenzidine	ND	(0.0368)	[1]	NA		NA		ND	(1.1)	[1]
3-Nitroaniline	ND	(0.032)	[1]	NA		NA		ND	(0.955)	[1]
4,6-Dinitro-2-methylphenol	ND	(0.0404)	[1]	NA		NA		ND	(1.2)	[1]
4-Bromophenyl phenyl ether	ND	(0.0172)	[1]	NA		NA		ND	(0.514)	[1]
4-Chloro-3-methylphenol	ND	(0.0165)	[1]	NA		NA		ND	(0.491)	[1]

Compiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to DV Report

RAMETER	9 A1 KRF-A1-U0002 0 - 2			9 A1 KRF-A1-U1618 16 - 18			9 A1 KRF-A1-U1618D 16 - 18			9 A1 KRF-A1-U1820 18 - 20		
270 - Semivolatile Organics, cont. (ug/g)												
enol	ND	(0.0153)	[1]	NA			NA			ND	(0.457)	[1]
rene	0.564	(0.0291)	[1]	NA			NA			1.6	(0.867)	[1]
s(2-Chloroethoxy)methane	ND	(0.026)	[1]	NA			NA			ND	(0.775)	[1]
s(2-Chloroethyl)ether	ND	(0.0201)	[1]	NA			NA			ND	(0.598)	[1]
s(2-Chloroisopropyl)ether	ND	(0.0182)	[1]	NA			NA			ND	(0.543)	[1]
s(2-Ethylhexyl)phthalate	0.379	(0.109)	[1]	NA			NA			73	(3.26)	[1]
Chloroaniline	ND	(0.0387)	[1]	NA			NA			ND	(1.15)	[1]
46 - Percent Moisture (percent)												
rcent moisture	18.5	(0)	[1]	24.2	(0)	[1]	15.8	(0)	[1]	19.3	(0)	[1]

ARAMETER	9 A1 KRF-A1-U2728 27 - 28			9 A2 KRF-A2-U0002 0 - 2			9 A2 KRF-A2-U0204 2 - 4			9 A2 KRF-A2-U0406 4 - 6		
240 - Volatile Organics, cont. (ug/kg)												
ans-1,2-Dichloroethene	ND	(178)	[100]	ND	(2.42)	[1]	ND	(2.46)	[1]	ND	(2.41)	[1]
ans-1,3-Dichloropropene	ND	(199)	[100]	ND	(1.8)	[1]	ND	(1.83)	[1]	ND	(1.8)	[1]
270 - Semivolatile Organics (ug/g)												
2,4-Trichlorobenzene	ND	(0.433)	[1]	ND	(0.018)	[1]	ND	(0.0186)	[1]	ND	(0.018)	[1]
2-Dichlorobenzene	ND	(0.605)	[1]	ND	(0.0252)	[1]	ND	(0.0259)	[1]	ND	(0.0252)	[1]
3-Dichlorobenzene	ND	(0.551)	[1]	ND	(0.0229)	[1]	ND	(0.0236)	[1]	ND	(0.0229)	[1]
4-Dichlorobenzene	ND	(0.721)	[1]	ND	(0.03)	[1]	ND	(0.0309)	[1]	ND	(0.03)	[1]
4,5-Trichlorophenol	ND	(0.542)	[1]	ND	(0.0226)	[1]	ND	(0.0232)	[1]	ND	(0.0225)	[1]
4,6-Trichlorophenol	ND	(0.645)	[1]	ND	(0.0269)	[1]	ND	(0.0277)	[1]	ND	(0.0269)	[1]
4-Dichlorophenol	ND	(0.857)	[1]	ND	(0.0357)	[1]	ND	(0.0367)	[1]	ND	(0.0357)	[1]
4-Dimethylphenol	ND	(0.795)	[1]	ND	(0.0331)	[1]	ND	(0.0341)	[1]	ND	(0.0331)	[1]
4-Dinitrophenol	ND	(1.1)	[1]	ND	(0.0459)	[1]	ND	(0.0473)	[1]	ND	(0.0459)	[1]
4-Dinitrotoluene	ND	(0.674)	[1]	ND	(0.028)	[1]	ND	(0.0289)	[1]	ND	(0.028)	[1]
6-Dinitrotoluene	ND	(0.734)	[1]	ND	(0.0306)	[1]	ND	(0.0315)	[1]	ND	(0.0306)	[1]
Chloronaphthalene	ND	(0.647)	[1]	ND	(0.0269)	[1]	ND	(0.0277)	[1]	ND	(0.0269)	[1]
Chlorophenol	ND	(0.557)	[1]	ND	(0.0232)	[1]	ND	(0.0239)	[1]	ND	(0.0232)	[1]
Methylnaphthalene	1.19	(0.572)	[1]	0.0316	(0.0238)	[1]	ND	(0.0245)	[1]	ND	(0.0238)	[1]
Methylphenol	ND	(0.309)	[1]	ND	(0.0129)	[1]	ND	(0.0133)	[1]	ND	(0.0129)	[1]
Nitroaniline	ND	(0.727)	[1]	ND	(0.0303)	[1]	ND	(0.0312)	[1]	ND	(0.0303)	[1]
Nitrophenol	ND	(0.73)	[1]	ND	(0.0304)	[1]	ND	(0.0313)	[1]	ND	(0.0304)	[1]
3'-Dichlorobenzidine	ND	(0.882)	[1]	ND	(0.0367)	[1]	ND	(0.0378)	[1]	ND	(0.0367)	[1]
Nitroaniline	ND	(0.767)	[1]	ND	(0.0319)	[1]	ND	(0.0329)	[1]	ND	(0.0319)	[1]
6-Dinitro-2-methylphenol	ND	(0.968)	[1]	ND	(0.0403)	[1]	ND	(0.0415)	[1]	ND	(0.0403)	[1]
Bromophenyl phenyl ether	ND	(0.413)	[1]	ND	(0.0172)	[1]	ND	(0.0177)	[1]	ND	(0.0172)	[1]
Chloro-3-methylphenol	ND	(0.394)	[1]	ND	(0.0164)	[1]	ND	(0.0169)	[1]	ND	(0.0164)	[1]
Chlorophenyl phenyl ether	ND	(0.461)	[1]	ND	(0.0192)	[1]	ND	(0.0198)	[1]	ND	(0.0192)	[1]
Methylphenol/3-Methylphenol	ND	(0.359)	[1]	ND	(0.015)	[1]	ND	(0.0154)	[1]	ND	(0.015)	[1]
Nitroaniline	ND	(1.07)	[1]	ND	(0.0447)	[1]	ND	(0.046)	[1]	ND	(0.0447)	[1]
Nitrophenol	ND	(1.14)	[1]	ND	(0.0475)	[1]	ND	(0.049)	[1]	ND	(0.0475)	[1]
enaphthene	ND	(0.63)	[1]	0.0475	(0.0262)	[1]	0.0502	(0.027)	[1]	ND	(0.0262)	[1]
enaphthylene	ND	(0.624)	[1]	ND	(0.026)	[1]	ND	(0.0267)	[1]	ND	(0.026)	[1]
thracene	ND	(0.752)	[1]	0.0711	(0.0313)	[1]	0.163	(0.0322)	[1]	< DL	(0.0313)	[1]
nzo(a)anthracene	ND	(0.586)	[1]	0.378	(0.0244)	[1]	0.625	(0.0251)	[1]	0.173	(0.0244)	[1]
nzo(a)pyrene	ND	(0.783)	[1]	0.459	(0.0326)	[1]	0.589	(0.0336)	[1]	0.182	(0.0326)	[1]
nzo(b)fluoranthene	ND	(1.03)	[1]	1.03 F	(0.0431)	[1]	1.12 F	(0.0444)	[1]	0.422 F	(0.0431)	[1]

piled: 22 Jun 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

RAMETER	9 A2 KRF-A2-U1012 10 - 12			9 A2 KRF-A2-U1012D 10 - 12			9 A2 KRF-A2-U1214 12 - 14			9 A2 KRF-A2-U1618 16 - 18		
8.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
drocarbons	1290	(32.1)	[1]	571	(33.4)	[1]	622	(34.6)	[1]	23000	(622)	[20]
240 - Volatile Organics (ug/kg)												
1,1-Trichloroethane	NA			NA			NA			ND	(391)	[200]
1,2,2-Tetrachloroethane	NA			NA			NA			ND	(799)	[200]
1,2-Trichloroethane	NA			NA			NA			ND	(478)	[200]
1-Dichloroethane	NA			NA			NA			ND	(458)	[200]
1-Dichloroethene	NA			NA			NA			ND	(646)	[200]
2-Dichloroethane	NA			NA			NA			ND	(681)	[200]
2-Dichloropropane	NA			NA			NA			ND	(426)	[200]
Chloroethyl vinyl ether	NA			NA			NA			ND	(247)	[200]
Hexanone	NA			NA			NA			ND	(765)	[200]
Methyl-2-Pentanone(MIBK)	NA			NA			NA			ND	(661)	[200]
etone	NA			NA			NA			ND	(1030)	[200]
nzene	NA			NA			NA			< DL	(891)	[200]
omodichloromethane	NA			NA			NA			ND	(567)	[200]
omomethane	NA			NA			NA			ND	(908)	[200]
rbon disulfide	NA			NA			NA			ND	(836)	[200]
rbon tetrachloride	NA			NA			NA			ND	(676)	[200]
lorobenzene	NA			NA			NA			29400	(539)	[200]
loroethane	NA			NA			NA			ND	(812)	[200]
loroform	NA			NA			NA			ND	(359)	[200]
loromethane	NA			NA			NA			ND	(690)	[200]
bromochloromethane	NA			NA			NA			ND	(403)	[200]
hyl benzene	NA			NA			NA			1120	(591)	[200]
thyl ethyl ketone	NA			NA			NA			ND	(1000)	[200]
thylene Chloride	NA			NA			NA			ND	(995)	[200]
yrene	NA			NA			NA			ND	(423)	[200]
trachloroethene	NA			NA			NA			ND	(638)	[200]
luene	NA			NA			NA			1120	(371)	[200]
ibromomethane(Bromoform)	NA			NA			NA			ND	(505)	[200]
ichloroethene	NA			NA			NA			ND	(480)	[200]
nyl Chloride	NA			NA			NA			ND	(725)	[200]
nyl acetate	NA			NA			NA			ND	(292)	[200]
lene (total)	NA			NA			NA			6520	(1150)	[200]
s-1,3-Dichloropropene	NA			NA			NA			ND	(438)	[200]

piled: 22 Ju 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

ARAMETER	9 A2 KRF-A2-U1012 10 - 12			9 A2 KRF-A2-U1012D 10 - 12			9 A2 KRF-A2-U1214 12 - 14			9 A2 KRF-A2-U1618 16 - 18			
8270 - Semivolatile Organics, cont. (ug/g)													
enzo(g,h,i)perylene	NA			NA			NA			ND X	(0.142)		[1]
enzo(k)fluoranthene	NA			NA			NA			0.172 XF	(0.138)		[1]
enzoic acid	NA			NA			NA			ND	(3.28)		[1]
enzyl alcohol	NA			NA			NA			ND	(0.0677)		[1]
utylbenzylphthalate	NA			NA			NA			ND	(0.229)		[1]
hrysene	NA			NA			NA			0.196	(0.125)		[1]
-n-octylphthalate	NA			NA			NA			ND X	(0.0648)		[1]
benz(a,h)anthracene	NA			NA			NA			ND X	(0.126)		[1]
benzofuran	NA			NA			NA			ND	(0.0696)		[1]
butylphthalate	NA			NA			NA			0.147	(0.0622)		[1]
ethylphthalate	NA			NA			NA			ND	(0.0319)		[1]
methylphthalate	NA			NA			NA			ND	(0.0563)		[1]
phenylamine	NA			NA			NA			ND	(0.113)		[1]
luoranthene	NA			NA			NA			0.562	(0.0741)		[1]
luorene	NA			NA			NA			0.354	(0.0577)		[1]
exachlorobenzene	NA			NA			NA			ND	(0.0693)		[1]
exachlorobutadiene	NA			NA			NA			ND	(0.13)		[1]
exachlorocyclopentadiene	NA			NA			NA			ND	(0.15)		[1]
exachloroethane	NA			NA			NA			ND	(0.0694)		[1]
ndeno(1,2,3-cd)pyrene	NA			NA			NA			ND X	(0.111)		[1]
sophorone	NA			NA			NA			ND	(0.0406)		[1]
-Nitroso-di-n-propylamine	NA			NA			NA			ND	(0.0775)		[1]
aphthalene	NA			NA			NA			1.37	(0.0971)		[1]
trobenzene	NA			NA			NA			ND	(0.0552)		[1]
ntachlorophenol	NA			NA			NA			ND	(0.12)		[1]
henanthrene	NA			NA			NA			0.907	(0.083)		[1]
henol	NA			NA			NA			ND	(0.0468)		[1]
yrene	NA			NA			NA			0.406	(0.089)		[1]
s(2-Chloroethoxy)methane	NA			NA			NA			ND	(0.0795)		[1]
s(2-Chloroethyl)ether	NA			NA			NA			ND	(0 0613)		[1]
s(2-Chloroisopropyl)ether	NA			NA			NA			ND	(0.0557)		[1]
s(2-Ethylhexyl)phthalate	NA			NA			NA			27.1	(0.668)		[2]
-Chloroaniline	NA			NA			NA			ND	(0.118)		[1]
346 - Percent Moisture (percent)													
ercent moisture	22.3	(0)	[1]	25.3	(0)	[1]	28	(0)	[1]	19.9	(0)		[1]

npiled: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

RAMETER	9 A2 KRF-A2-U1618D 16 - 18			9 A2 KRF-A2-U2022 20 - 22			9 A2 KRF-A2-U2628 26 - 28	9 E1 KRF-E1-U0002 0 - 2
240 - Volatile Organics, cont. (ug/kg)								
ans-1,2-Dichloroethene	ND	(106)	[50]	ND	(2200)	[1000]	NA	NA
ans-1,3-Dichloropropene	ND	(119)	[50]	ND	(2460)	[1000]	NA	NA
270 - Semivolatile Organics (ug/g)								
,4-Trichlorobenzene	ND	(0.0553)	[1]	24.5	(5.48)	[10]	NA	NA
-Dichlorobenzene	0.0827	(0.0772)	[1]	989	(7.66)	[10]	NA	NA
-Dichlorobenzene	0.228	(0.0702)	[1]	58.8	(0.697)	[1]	NA	NA
-Dichlorobenzene	1.14	(0.0919)	[1]	118	(0.912)	[1]	NA	NA
,5-Trichlorophenol	ND	(0.0691)	[1]	ND	(0.686)	[1]	NA	NA
,6-Trichlorophenol	ND	(0.0823)	[1]	ND	(0.817)	[1]	NA	NA
-Dichlorophenol	ND	(0.109)	[1]	ND	(1.08)	[1]	NA	NA
-Dimethylphenol	ND	(0.101)	[1]	46.7	(1.01)	[1]	NA	NA
-Dinitrophenol	ND	(0.141)	[1]	ND	(1.4)	[1]	NA	NA
-Dinitrotoluene	ND	(0.0859)	[1]	ND	(0.852)	[1]	NA	NA
-Dinitrotoluene	ND	(0.0936)	[1]	ND	(0.929)	[1]	NA	NA
hloronaphthalene	ND	(0.0826)	[1]	ND	(0.819)	[1]	NA	NA
hlorophenol	ND	(0.0711)	[1]	ND	(0.705)	[1]	NA	NA
ethylnaphthalene	1.02	(0.073)	[1]	31.4	(0.724)	[1]	NA	NA
ethylphenol	ND	(0.0395)	[1]	7.4	(0.392)	[1]	NA	NA
itroaniline	ND	(0.0928)	[1]	ND	(0.92)	[1]	NA	NA
itrophenol	ND	(0.0932)	[1]	ND	(0.924)	[1]	NA	NA
'-Dichlorobenzidine	ND	(0.112)	[1]	ND	(1.12)	[1]	NA	NA
itroaniline	ND	(0.0979)	[1]	ND	(0.971)	[1]	NA	NA
-Dinitro-2-methylphenol	ND	(0.123)	[1]	ND	(1.22)	[1]	NA	NA
romophenyl phenyl ether	ND	(0.0527)	[1]	ND	(0.523)	[1]	NA	NA
hloro-3-methylphenol	ND	(0.0503)	[1]	ND	(0.499)	[1]	NA	NA
hlorophenyl phenyl ether	ND	(0.0588)	[1]	ND	(0.583)	[1]	NA	NA
ethylphenol/3-Methylphenol	ND	(0.0458)	[1]	23.2 F	(0.455)	[1]	NA	NA
itroaniline	ND	(0.137)	[1]	ND	(1.36)	[1]	NA	NA
itrophenol	ND	(0.146)	[1]	ND	(1.45)	[1]	NA	NA
naphthene	ND	(0.0803)	[1]	ND	(0.797)	[1]	NA	NA
naphthylene	< DL	(0.0796)	[1]	ND	(0.789)	[1]	NA	NA
hracene	ND	(0.0959)	[1]	ND	(0.951)	[1]	NA	NA
zo(a)anthracene	0.0907	(0.0747)	[1]	ND	(0.741)	[1]	NA	NA
zo(a)pyrene	< DL	(0.0999)	[1]	ND	(0.991)	[1]	NA	NA
zo(b)fluoranthene	0.199 F	(0.132)	[1]	ND	(1.31)	[1]	NA	NA

oiled: 22 Jul 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

RAMETER	9 E1 KRF-E1-U1012 10 - 12			9 E1 KRF-E1-U1618 16 - 18			9 E1 KRF-E1-U1618D 16 - 18			9 E1 KRF-E1-U2425 24 - 25		
8.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)				22,000 SV								
drocarbons	3350	(285)	[10]	~~21300~~	(536)	[20]	22900	(536)	[20]	4690	(132)	[5]
240 - Volatile Organics (ug/kg)												
1,1-Trichloroethane	NA			ND	(532)	[500]	ND	(530)	[500]	ND	(1050)	[1000]
1,2,2-Tetrachloroethane	NA			ND	(692)	[500]	ND	(690)	[500]	ND	(1370)	[1000]
1,2-Trichloroethane	NA			ND	(525)	[500]	ND	(524)	[500]	ND	(1040)	[1000]
1-Dichloroethane	NA			ND	(417)	[500]	ND	(416)	[500]	ND	(825)	[1000]
1-Dichloroethene	NA			ND	(1030)	[500]	ND	(1030)	[500]	ND	(2040)	[1000]
2-Dichloroethane	NA			ND	(762)	[500]	ND	(760)	[500]	ND	(1510)	[1000]
2-Dichloropropane	NA			ND	(1440)	[500]	ND	(1430)	[500]	ND	(2850)	[1000]
Chloroethyl vinyl ether	NA			ND	(762)	[500]	ND	(760)	[500]	ND	(1510)	[1000]
Hexanone	NA			ND	(842)	[500]	ND	(840)	[500]	ND	(1670)	[1000]
Methyl-2-Pentanone(MIBK)	NA			ND	(569)	[500]	ND	(567)	[500]	ND	(1130)	[1000]
etone	NA			< DL	(3150)	[500]	< DL	(3140)	[500]	< DL	(6230)	[1000]
nzene	NA			923	(352)	[500]	1590	(352)	[500]	< DL	(698)	[1000]
omodichloromethane	NA			ND	(1930)	[500]	ND	(1920)	[500]	ND	(3810)	[1000]
omomethane	NA			ND	(992)	[500]	ND	(990)	[500]	ND	(1960)	[1000]
rbon disulfide	NA			ND	(789)	[500]	ND	(787)	[500]	ND	(1560)	[1000]
rbon tetrachloride	NA			ND	(778)	[500]	ND	(776)	[500]	ND	(1540)	[1000]
lorobenzene	NA			55500	(542)	[500]	70500	(541)	[500]	94900	(1070)	[1000]
loroethane	NA			ND	(724)	[500]	ND	(722)	[500]	ND	(1430)	[1000]
loroform	NA			ND	(323)	[500]	ND	(322)	[500]	ND	(639)	[1000]
loromethane	NA			ND	(524)	[500]	< DL	(522)	[500]	ND	(1040)	[1000]
romochloromethane	NA			ND	(380)	[500]	ND	(379)	[500]	ND	(753)	[1000]
yl benzene	NA			ND	(590)	[500]	ND	(589)	[500]	< DL	(1170)	[1000]
thyl ethyl ketone	NA			1720 B	(1480)	[500]	1720 B	(1480)	[500]	3550 B	(2930)	[1000]
thylene Chloride	NA			3440	(992)	[500]	1170	(990)	[500]	2430	(1960)	[1000]
rene	NA			ND	(579)	[500]	ND	(578)	[500]	ND	(1150)	[1000]
trachloroethene	NA			ND	(783)	[500]	ND	(781)	[500]	ND	(1550)	[1000]
luene	NA			ND	(432)	[500]	ND	(431)	[500]	4690	(855)	[1000]
bromomethane(Bromoform)	NA			ND	(260)	[500]	ND	(259)	[500]	ND	(514)	[1000]
chloroethene	NA			ND	(837)	[500]	ND	(835)	[500]	ND	(1660)	[1000]
yl Chloride	NA			ND	(660)	[500]	ND	(658)	[500]	ND	(1310)	[1000]
yl acetate	NA			ND	(440)	[500]	ND	(439)	[500]	ND	(871)	[1000]
ene (total)	NA			ND	(1360)	[500]	ND	(1360)	[500]	7260	(2700)	[1000]
s-1,3-Dichloropropene	NA			ND	(291)	[500]	ND	(290)	[500]	ND	(576)	[1000]

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AMETER	9 E1 KRF-E1-U1012 10 - 12				9 E1 KRF-E1-U1618 16 - 18				9 E1 KRF-E1-U1618D 16 - 18				9 E1 KRF-E1-U2425 24 - 25			
70 - Semivolatile Organics, cont.	(ug/g)															
zo(g,h,i)perylene	NA				ND		(0.12)	[1]	ND	X	(0.122)	[1]	ND	(1.12)	[1]	
zo(k)fluoranthene	NA				0.216	F	(0.117)	[1]	0.305	XF	(0.119)	[1]	ND	(1.09)	[1]	
zoic acid	NA				ND		(2.76)	[1]	ND		(2.81)	[1]	ND	(25.9)	[1]	
zyl alcohol	NA				ND		(0.057)	[1]	ND		(0.0581)	[1]	ND	(0.535)	[1]	
ylbenzylphthalate	NA				ND		(0.193)	[1]	< DL		(0.197)	[1]	ND	(1.81)	[1]	
rsene	NA				0.203		(0.105)	[1]	0.233		(0.107)	[1]	ND	(0.985)	[1]	
n-octylphthalate	NA				ND		(0.0546)	[1]	ND	X	(0.0556)	[1]	ND	(0.512)	[1]	
enz(a,h)anthracene	NA				ND		(0.106)	[1]	ND	X	(0.108)	[1]	ND	(0.995)	[1]	
enzofuran	NA				ND	X	(0.0587)	[1]	ND	X	(0.0598)	[1]	ND	(0.551)	[1]	
tylphthalate	NA				0.612		(0.0524)	[1]	0.677		(0.0534)	[1]	ND	(0.492)	[1]	
hylphthalate	NA				ND	X	(0.0269)	[1]	ND	X	(0.0274)	[1]	ND	(0.252)	[1]	
thylphthalate	NA				ND	X	(0.0475)	[1]	ND	X	(0.0483)	[1]	ND	(0.445)	[1]	
henylamine	NA				ND		(0.0953)	[1]	ND		(0.0971)	[1]	ND	(0.894)	[1]	
oranthene	NA				3.1		(0.0625)	[1]	3.84		(0.0636)	[1]	0.664	(0.586)	[1]	
rene	NA				ND	X	(0.0486)	[1]	ND	X	(0.0495)	[1]	ND	(0.456)	[1]	
chlorobenzene	NA				0.171		(0.0584)	[1]	ND		(0.0595)	[1]	ND	(0.548)	[1]	
chlorobutadiene	NA				ND		(0.109)	[1]	ND		(0.111)	[1]	ND	(1.02)	[1]	
chlorocyclopentadiene	NA				ND	X	(0.126)	[1]	ND	X	(0.128)	[1]	ND	(1.18)	[1]	
chloroethane	NA				ND		(0.0585)	[1]	ND		(0.0596)	[1]	ND	(0.549)	[1]	
no(1,2,3-cd)pyrene	NA				ND		(0.0935)	[1]	ND	X	(0.0953)	[1]	ND	(0.878)	[1]	
horone	NA				ND		(0.0342)	[1]	ND		(0.0349)	[1]	ND	(0.321)	[1]	
troso-di-n-propylamine	NA				ND		(0.0653)	[1]	ND		(0.0665)	[1]	ND	(0.613)	[1]	
thalene	NA				ND		(0.0818)	[1]	ND		(0.0833)	[1]	2.9/	(0.767)	[1]	
obenzene	NA				ND		(0.0465)	[1]	ND		(0.0474)	[1]	ND	(0.436)	[1]	
achlorophenol	NA				ND		(0.101)	[1]	ND		(0.103)	[1]	ND	(0.947)	[1]	
anthrene	NA				1.46		(0.0699)	[1]	1.63		(0.0712)	[1]	ND	(0.656)	[1]	
ol	NA				ND		(0.0395)	[1]	ND		(0.0402)	[1]	ND	(0.37)	[1]	
ne	NA				0.736		(0.075)	[1]	0.785		(0.0763)	[1]	ND	(0.703)	[1]	
2-Chloroethoxy)methane	NA				ND		(0.067)	[1]	ND		(0.0682)	[1]	ND	(0.629)	[1]	
2-Chloroethyl)ether	NA				ND		(0.0517)	[1]	ND		(0.0526)	[1]	ND	(0.485)	[1]	
2-Chloroisopropyl)ether	NA				ND		(0.0469)	[1]	ND		(0.0478)	[1]	ND	(0.44)	[1]	
2-Ethylhexyl)phthalate	NA				25.9		(1.41)	[5]	26.1		(1.43)	[5]	3.61	(2.64)	[1]	
loroaniline	NA				ND		(0.0995)	[1]	ND		(0.101)	[1]	ND	(0.934)	[1]	
- Percent Moisture	(percent)															
ent moisture	12.5		(0)	[1]	6.89		(0)	[1]	7.13		(0)	[1]	6.01	(0)	[1]	

led: 22 June 1994 () = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

ARAMETER	9 E3 KRF-E3-U1618 16 - 18			9 E3 KRF-E3-U2022 20 - 22			9 E3 KRF-E3-U2829 28 - 29			9 E4 KRF-E4-U0709 7 - 9		
18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
ydrocarbons	7410	(157)	[5]	1360	(33.3)	[1]	325	(26.5)	[1]	1310	(29.7)	[1]
8240 - Volatile Organics (ug/kg)												
,1,1-Trichloroethane	ND	(125)	[100]	ND	(13100)	[10000]	NA			NA		
,1,2,2-Tetrachloroethane	ND	(163)	[100]	ND	(17100)	[10000]	NA			NA		
,1,2-Trichloroethane	ND	(123)	[100]	ND	(13000)	[10000]	NA			NA		
,1-Dichloroethane	ND	(98)	[100]	ND	(10300)	[10000]	NA			NA		
,1-Dichloroethene	ND	(242)	[100]	ND	(25500)	[10000]	NA			NA		
,2-Dichloroethane	ND	(179)	[100]	ND	(18800)	[10000]	NA			NA		
,2-Dichloropropane	ND	(338)	[100]	ND	(35500)	[10000]	NA			NA		
-Chloroethyl vinyl ether	ND	(179)	[100]	ND	(18800)	[10000]	NA			NA		
-Hexanone	ND	(198)	[100]	ND	(20800)	[10000]	NA			NA		
-Methyl-2-Pentanone(MIBK)	ND	(134)	[100]	ND	(14100)	[10000]	NA			NA		
cetone	< DL	(740)	[100]	ND	(77900)	[10000]	NA			NA		
enzene	ND	(82.8)	[100]	ND	(8710)	[10000]	NA			NA		
romodichloromethane	ND	(453)	[100]	ND	(47600)	[10000]	NA			NA		
romomethane	ND	(233)	[100]	ND	(24500)	[10000]	NA			NA		
arbon disulfide	ND	(185)	[100]	ND	(19500)	[10000]	NA			NA		
arbon tetrachloride	ND	(183)	[100]	ND	(19200)	[10000]	NA			NA		
hlorobenzene	8440	(127)	[100]	< DL	(13400)	[10000]	NA			NA		
hloroethane	ND	(170)	[100]	ND	(17900)	[10000]	NA			NA		
hloroform	ND	(75.9)	[100]	ND	(7980)	[10000]	NA			NA		
hloromethane	ND	(123)	[100]	< DL	(12900)	[10000]	NA			NA		
ibromochloromethane	ND	(89.4)	[100]	ND	(9400)	[10000]	NA			NA		
thyl benzene	< DL	(139)	[100]	< DL	(14600)	[10000]	NA			NA		
ethyl ethyl ketone	467 B	(348)	[100]	ND	(36600)	[10000]	NA			NA		
ethylene Chloride	339	(233)	[100]	35100	(24500)	[10000]	NA			NA		
tyrene	ND	(136)	[100]	ND	(14300)	[10000]	NA			NA		
etrachloroethene	ND	(184)	[100]	ND	(19400)	[10000]	NA			NA		
oluene	ND	(102)	[100]	80600	(10700)	[10000]	NA			NA		
ribromomethane(Bromoform)	ND	(61)	[100]	ND	(6420)	[10000]	NA			NA		
richloroethene	ND	(197)	[100]	ND	(20700)	[10000]	NA			NA		
nyl Chloride	ND	(155)	[100]	ND	(16300)	[10000]	NA			NA		
nyl acetate	ND	(103)	[100]	ND	(10900)	[10000]	NA			NA		
ylene (total)	ND	(320)	[100]	89900	(33700)	[10000]	NA			NA		
s-1,3-Dichloropropene	ND	(68.3)	[100]	ND	(7190)	[10000]	NA			NA		

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RAMETER	9 E3 KRF-E3-U1618 16 - 18			9 E3 KRF-E3-U2022 20 - 22			9 E3 KRF-E3-U2829 28 - 29			9 E4 KRF-E4-U0709 7 - 9		
270 - Semivolatile Organics, cont. (ug/g)												
nzo(g,h,i)perylene	ND	(0.083)	[1]	< DL	(0.82)	[1]	NA			NA		
nzo(k)fluoranthene	< DL	(0.108)	[1]	< DL	(1.07)	[1]	NA			NA		
nzoic acid	ND	(0.74)	[1]	ND	(7.3)	[1]	NA			NA		
nzyl alcohol	ND	(0.0746)	[1]	ND	(0.736)	[1]	NA			NA		
tylbenzylphthalate	ND	(0.217)	[1]	< DL	(2.14)	[1]	NA			NA		
rysene	< DL	(0.0894)	[1]	< DL	(0.882)	[1]	NA			NA		
-n-octylphthalate	ND	(0.0979)	[1]	ND	(0.966)	[1]	NA			NA		
benz(a,h)anthracene	ND	(0.0898)	[1]	ND	(0.886)	[1]	NA			NA		
benzofuran	ND	(0.0682)	[1]	ND	(0.673)	[1]	NA			NA		
butylphthalate	ND	(0.0714)	[1]	2.86	(0.705)	[1]	NA			NA		
ethylphthalate	ND	(0.0467)	[1]	ND	(0.461)	[1]	NA			NA		
methylphthalate	ND	(0.0488)	[1]	ND	(0.482)	[1]	NA			NA		
phenylamine	ND	(0.114)	[1]	ND	(1.12)	[1]	NA			NA		
uoranthene	0.278	(0.0769)	[1]	26.2	(0.759)	[1]	NA			NA		
uorene	0.128	(0.0638)	[1]	3.27	(0.629)	[1]	NA			NA		
xachlorobenzene	ND	(0.0865)	[1]	2.76	(0.853)	[1]	NA			NA		
xachlorobutadiene	ND	(0.0904)	[1]	ND	(0.892)	[1]	NA			NA		
xachlorocyclopentadiene	ND	(0.261)	[1]	ND	(2.58)	[1]	NA			NA		
xachloroethane	ND	(0.103)	[1]	ND	(1.02)	[1]	NA			NA		
deno(1,2,3-cd)pyrene	ND	(0.0651)	[1]	< DL	(0.643)	[1]	NA			NA		
ophorone	ND	(0.0938)	[1]	ND	(0.926)	[1]	NA			NA		
Nitroso-di-n-propylamine	ND	(0.0529)	[1]	ND	(0.522)	[1]	NA			NA		
phthalene	0.207	(0.0778)	[1]	53.3	(0.767)	[1]	NA			NA		
trobenzene	ND	(0.14)	[1]	ND	(1.38)	[1]	NA			NA		
ntachlorophenol	ND	(0.13)	[1]	ND	(1.28)	[1]	NA			NA		
enanthrene	0.336	(0.0999)	[1]	4.79	(0.985)	[1]	NA			NA		
enol	ND	(0.0408)	[1]	4.2	(0.403)	[1]	NA			NA		
rene	0.113	(0.0547)	[1]	1.59	(0.54)	[1]	NA			NA		
s(2-Chloroethoxy)methane	ND	(0.103)	[1]	ND	(1.01)	[1]	NA			NA		
s(2-Chloroethyl)ether	ND	(0.113)	[1]	ND	(1.12)	[1]	NA			NA		
s(2-Chloroisopropyl)ether	ND	(0.14)	[1]	ND	(1.38)	[1]	NA			NA		
s(2-Ethylhexyl)phthalate	15.2 B	(0.183)	[1]	132 B	(1.8)	[1]	NA			NA		
Chloroaniline	ND	(0.109)	[1]	ND	(1.08)	[1]	NA			NA		
46 - Percent Moisture (percent)												
rcent moisture	20.7	(0)	[1]	24.9	(0)	[1]	5.94	(0)	[1]	16	(0)	[1]

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ARAMETER	9 E4 KRF-E4-U0911 9 - 11				9 E4 KRF-E4-U2426 24 - 26				9 E5 KRF-E5-U0406 4 - 6				9 E5 KRF-E5-U0608 6 - 8			
8240 - Volatile Organics, cont. (ug/kg)																
rans-1,2-Dichloroethene	ND		(2.28)	[1]	ND		(1810)	[1000]	ND		(2.32)	[1]	ND		(2.31)	[1]
rans-1,3-Dichloropropene	ND		(1.7)	[1]	ND		(1590)	[1000]	ND		(1.73)	[1]	ND		(1.72)	[1]
8270 - Semivolatile Organics (ug/g)																
2,4-Trichlorobenzene	ND	XY	(0.0865)	[5]	0.248		(0.0927)	[1]	ND		(0.0348)	[1]	ND		(0.0345)	[1]
2-Dichlorobenzene	ND	XY	(0.121)	[5]	1.24		(0.0784)	[1]	ND		(0.0295)	[1]	0.045		(0.0292)	[1]
3-Dichlorobenzene	ND	XY	(0.11)	[5]	2.63		(0.0477)	[1]	ND		(0.0179)	[1]	ND		(0.0177)	[1]
4-Dichlorobenzene	ND	XY	(0.144)	[5]	17.9		(0.149)	[2]	ND		(0.0281)	[1]	ND		(0.0278)	[1]
4,5-Trichlorophenol	ND	XY	(0.108)	[5]	ND		(0.0743)	[1]	ND		(0.028)	[1]	ND		(0.0277)	[1]
4,6-Trichlorophenol	ND	XY	(0.129)	[5]	ND		(0.0535)	[1]	ND		(0.0201)	[1]	ND		(0.0199)	[1]
4-Dichlorophenol	ND	XY	(0.171)	[5]	ND		(0.0239)	[1]	ND		(0.009)	[1]	ND		(0.00891)	[1]
4-Dimethylphenol	ND	XY	(0.159)	[5]	ND		(0.0934)	[1]	ND		(0.0351)	[1]	ND		(0.0348)	[1]
4-Dinitrophenol	ND	XY	(0.22)	[5]	ND		(0.297)	[1]	ND		(0.111)	[1]	ND		(0.11)	[1]
4-Dinitrotoluene	ND	XY	(0.134)	[5]	ND		(0.0532)	[1]	ND		(0.02)	[1]	ND		(0.0198)	[1]
6-Dinitrotoluene	ND	XY	(0.147)	[5]	ND		(0.0838)	[1]	ND		(0.0315)	[1]	ND		(0.0312)	[1]
Chloronaphthalene	ND	XY	(0.129)	[5]	ND		(0.122)	[1]	ND		(0.0458)	[1]	ND		(0.0454)	[1]
Chlorophenol	ND	XY	(0.111)	[5]	ND		(0.0717)	[1]	ND		(0.027)	[1]	ND		(0.0267)	[1]
Methylnaphthalene	ND	XY	(0.114)	[5]	6.13		(0.0772)	[1]	ND		(0.029)	[1]	< DL		(0.0288)	[1]
Methylphenol	ND	XY	(0.0618)	[5]	ND		(0.0673)	[1]	ND		(0.0253)	[1]	ND		(0.0251)	[1]
Nitroaniline	ND	XY	(0.145)	[5]	ND		(0.122)	[1]	ND		(0.0458)	[1]	ND		(0.0454)	[1]
Nitrophenol	ND	XY	(0.146)	[5]	ND		(0.0732)	[1]	ND		(0.0275)	[1]	ND		(0.0273)	[1]
3'-Dichlorobenzidine	ND	XY	(0.176)	[5]	ND		(0.0571)	[1]	ND		(0.0215)	[1]	ND		(0.0213)	[1]
Nitroaniline	ND	XY	(0.153)	[5]	ND		(0.0911)	[1]	ND		(0.0342)	[1]	ND		(0.0339)	[1]
6-Dinitro-2-methylphenol	ND	XY	(0.193)	[5]	ND		(0.103)	[1]	ND		(0.0389)	[1]	ND		(0.0385)	[1]
Bromophenyl phenyl ether	ND	XY	(0.0824)	[5]	ND		(0.0933)	[1]	ND		(0.0351)	[1]	ND		(0.0347)	[1]
Chloro-3-methylphenol	ND	XY	(0.0787)	[5]	ND		(0.0704)	[1]	ND		(0.0265)	[1]	ND		(0.0262)	[1]
Chlorophenyl phenyl ether	ND	XY	(0.092)	[5]	ND		(0.0608)	[1]	ND		(0.0229)	[1]	ND		(0.0226)	[1]
Methylphenol/3-Methylphenol	ND	XY	(0.0717)	[5]	ND		(0.0464)	[1]	ND		(0.0174)	[1]	ND		(0.0173)	[1]
Nitroaniline	ND	XY	(0.214)	[5]	ND		(0.115)	[1]	ND		(0.0434)	[1]	ND		(0.043)	[1]
Nitrophenol	ND	XY	(0.228)	[5]	ND		(0.295)	[1]	ND		(0.111)	[1]	ND		(0.11)	[1]
enaphthene	ND	XY	(0.126)	[5]	ND		(0.077)	[1]	ND		(0.0289)	[1]	0.0603		(0.0287)	[1]
enaphthylene	ND	XY	(0.125)	[5]	ND		(0.0671)	[1]	ND		(0.0252)	[1]	ND		(0.025)	[1]
thracene	< DL	XY	(0.15)	[5]	< DL		(0.0623)	[1]	0.0297		(0.0234)	[1]	0.144		(0.0232)	[1]
nzo(a)anthracene	0.151	XY	(0.117)	[5]	< DL		(0.0583)	[1]	0.0836		(0.0219)	[1]	0.344		(0.0217)	[1]
nzo(a)pyrene	< DL	XY	(0.156)	[5]	ND		(0.0737)	[1]	0.102		(0.0277)	[1]	0.329		(0.0274)	[1]
nzo(b)fluoranthene	< DL	XY	(0.207)	[5]	ND		(0.0744)	[1]	0.244	F	(0.028)	[1]	0.735	F	(0.0277)	[1]

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AMETER	9 E5 KRF-E5-U1012 10 - 12			9 E5 KRF-E5-U1214 12 - 14			9 E5 KRF-E5-U1820 18 - 20			9 E5 KRF-E5-U2022 20 - 22		
.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
rocarbons	668	(30.4)	[1]	739	(31.7)	[1]	105000	(1630)	[50]	43500	(1680)	[50]
6 - Percent Moisture (percent)												
cent moisture	18	(0)	[1]	21.2	(0)	[1]	23.3	(0)	[1]	25.6	(0)	[1]

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