RF/RMRS-99-415.UN

ANALYSIS REPORT ON GEOPROBE™ BOREHOLES FOR HYDRANT INSTALLATION ON TENTH STREET

AUGUST, 1999

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IA-IA-A-00206

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Best Available Copy

ANALYSIS REPORT FOR GEOPROBE™BORINGS FOR THE INSTALLATION OF A FIRE HYDRANT ALONG TENTH STREET IN THE PROTECTED AREA

1.0 INTRODUCTION

Rocky Mountain Remediation Services, L L C (RMRS) has prepared this Summary Report for the Department of Energy (DOE) at the Rocky Flats Environmental Technology Site (RFETS) Activities performed during this investigation were conducted under applicable Federal, State, and local regulations and agreements, as well as DOE Orders, RFETS policies and procedures, Environmental Restoration (ER) Operating Procedures, the RFETS Integrated Monitoring Plan (IMP), the Rocky Flats Cleanup Agreement (RFCA), and the *Sampling and Analysis Plan for the Installation of a Fire Hydrant Along Tenth Street in the Protected Area* (RF/RMRS-99-355), which was written specifically for this project

2.0 PURPOSE

This investigation was performed in association with the installation of a new fire hydrant in the Protected Area (PA) at RFETS The new hydrant will be located east of Tent 4 on the 750 Pad, along Tenth Street, in the PA (Figure 2-1) The purpose of this investigation was to assess the impact of potential soil contamination in the area on activities associated with the construction of the new hydrant In order to assess existing soil conditions, three Geoprobe™ boreholes were completed within the anticipated construction area The Geoprobe™ boreholes were completed to ensure construction worker safety and to ensure that there is not a Resource Conservation and Recovery Act (RCRA) issue with material that will be excavated during the removal and construction phase of the project Excavated material may consist of soil and construction demolition debris All work completed during the investigative portion of this project was performed in accordance with the RMRS Quality Assurance Program Description (QAPD) (RMRS, 1998, Rev 2)

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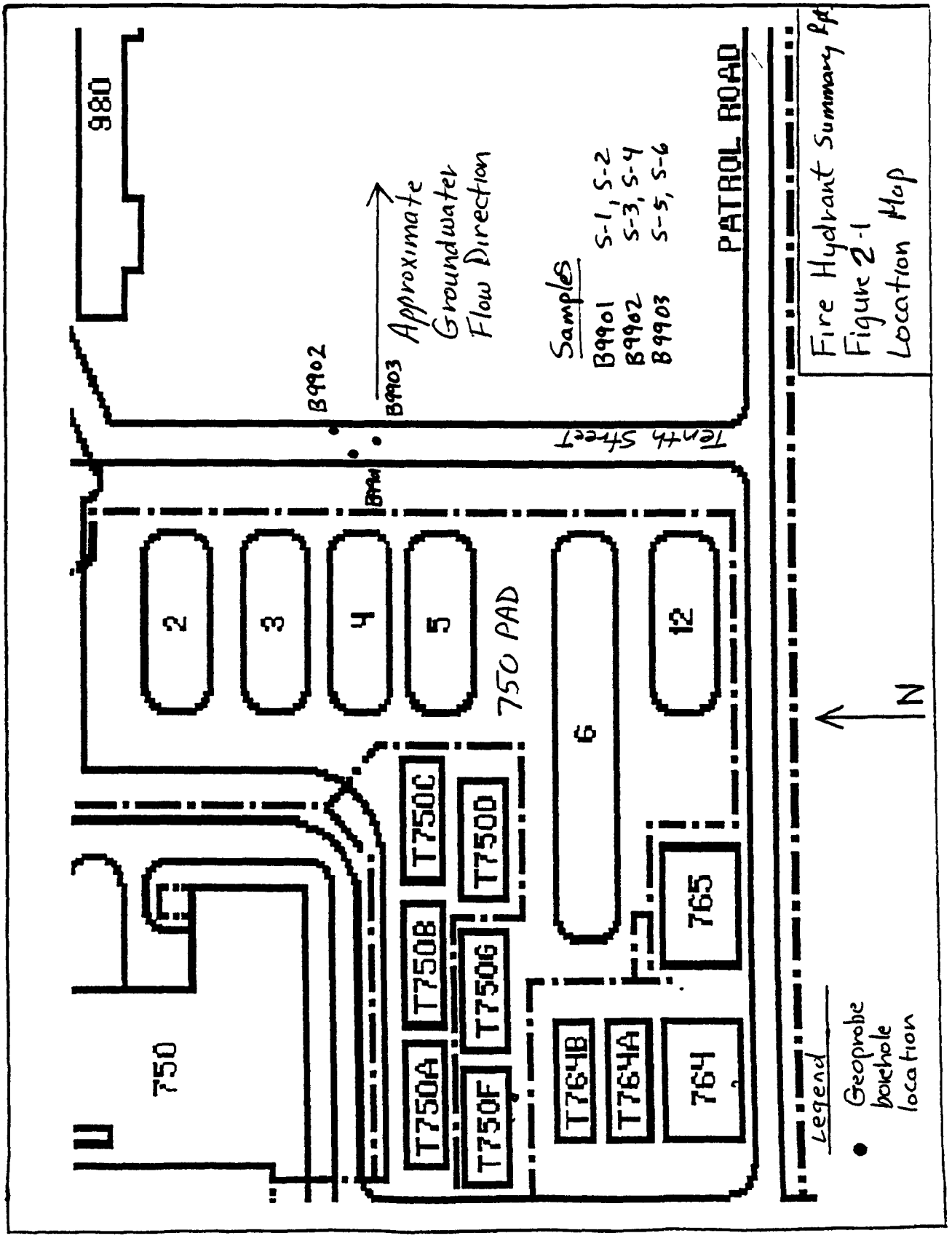
Figure 2.1, Geoprobe™ Borehole Location



This drawing photo-enlarged from a RFETS provided diagram at 1:2270 scale

3 0 BACKGROUND

The 750 Pad is located in the PA at RFETS and is used for the storage of pondcrete and saltcrete waste Pondcrete consists of solidified low-level radioactive and hazardous waste extracted from the Solar Evaporation Ponds Saltcrete consists of solidified low-level radioactive and hazardous waste extracted from process waste by distillation at Building 374 The 750 Pad is immediately upgradient of the new hydrant construction site The work area is in or near IHSS 214 and associated Potential Area of Concern (PAC) 700-214 IHSS 214 was established based on past operations at the 750 Pad, specifically the storage of pondcrete and saltcrete Releases have occurred over the years that may have resulted in contamination of nearby surface soils (DOE 1992) The contaminants of concern (COCs) are volatile organic compounds (VOCs), metals, and radionuclides There was little data available relating to the specific metals and VOCs, and their concentrations, which could potentially be encountered Plutonium (Pu-239/240) and americium (Am-241) are the radionuclides which could have potentially been encountered

It was thought that groundwater may be encountered during the completion of the Geoprobe™ boreholes and the approved site specific SAP referenced above provided for this possibility

4 0 SITE CONDITIONS

The RFETS is situated on a gently eastward sloping topographic and bedrock pediment surface mantled by, depending on location, unconsolidated Rocky Flats Alluvium and/or colluvium, and underlain mainly by claystones and siltstones of the Cretaceous Laramie Formation (EG&G, 1995 A) The 750 Pad lies on a thin veneer of Rocky Flats Alluvium

Soils identified during the completion of the three Geoprobe™ boreholes consist mainly of clay and sandy clay with a little fine grained sand at the surface and shallow subsurface in boreholes B9901 and B9903 Borehole B9902 has clayey gravel with some fine sand, described as fill, at the surface and shallow subsurface All of the boreholes terminated in sandy or silty clay that was described at B9902 as weathered claystone

There was no groundwater encountered in any of the three boreholes The total depth of each borehole was ten feet There were no photoionization detector (PID) readings above background for any soil sample which was field screened during this investigation Borehole logs can be found in Appendix A

5.0 FIELD PROCEDURES

The boreholes were advanced with a standard Geoprobe™ rig owned and operated by TEG Rocky Mountain of Denver, Colorado The Geoprobe™ operates by pneumatically hammering a string of steel rods into the ground to the desired depth A variety of sampling tools allows the investigation team to acquire soil and/or groundwater samples

Field procedures were followed as outlined in the approved site specific SAP referenced above Two soil samples were collected from each borehole for submittal to the analytical laboratory The first sample, a grab sample, was collected at 0 5 feet below ground surface The second sample, a composite, was collected from the interval of 7 to 10 feet below ground surface All sample equipment and investigation team members were scanned by a radiation control technician (RCT) between samples and after the completion of a borehole

Boreholes were backfilled with bentonite chips from approximately 10 feet to 0 5 feet below ground surface Six inches of concrete were placed at the top of the abandoned borehole Decontamination procedures were followed as outlined in the SAP

A rinseate sample and QA/QC soil sample were collected at the end of the day after completion of the additional Geoprobe™ boreholes at Building 984 Reference, *Analysis Report on Installation of Geoprobe™ Boreholes for Building 984*, for the results of those samples

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6 0 LABORATORY ANALYSES

Soil samples collected as part of this investigation were sent to analytical laboratories for analysis Rad-screen samples were hand delivered to Thermo NUtech at RFETS Metals and VOC samples were shipped via Federal Express to Southwest Laboratory of Oklahoma located in Broken Arrow, Oklahoma Radionuclide Isotopic samples were shipped via Federal Express to Sanford Cohen & Associates (Southeastern Environmental Laboratory) located in Montgomery, Alabama

All samples were analyzed by the analytical methods specified in the SAP

7.0 LABORATORY RESULTS

Laboratory results, which consisted of Rad-screen, volatile organic compounds, metals, and radionuclides, were reviewed thoroughly to ensure that there were no exceedances of any RFETS standards which might affect construction at the site Sixty-four (64) different VOCs and twenty-seven (27) different metals were analyzed for Plutonium, Americium and uranium isotopes (U-233/234 and U-238) were the radionuclides analyzed for

Results of the laboratory analyses are as follows

Rad-screen – All analyses resulted in a Department of Transportation (DOT) rating of NONRAD

VOCs – All VOC results are well below Tier II action levels for surface and subsurface soils

Metals – All metals results are below Tier II action levels for surface and subsurface soils Although some of the iron results appear high, they are all within the RFETS sitewide background soil results mean plus two standard deviations This is the criterion for evaluating if a result is within the range of expected background levels (EG &G 1995 B)

Radionuclide Isotopes – All radionuclide isotope analyses were well below the Tier II action levels for surface and subsurface soil

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The individual reports from the analytical laboratories can be found in Appendix B as follows Appendix B-1 contains Rad-screen results, Appendix B-2 contains the list of VOCs analyzed for and VOCs and metals lab results, and Appendix B-3 contains radionuclide isotope results
The individual reports from the analytical laboratories can be found in Appendix B as follows Appendix B-1 contains Rad-screen results, Appendix B-2 contains VOCs and metals results, and Appendix B-3 contains radionuclide isotope results

8 0 CONCLUSIONS

There are no levels of VOCs, metals, or radioisotopes that will impact the removal and construction activities associated with the installation of the new fire hydrant immediately east of Tent 4 on the 750 Pad in the PA at RFETS Construction worker safety will not be impacted from an environmental standpoint because there does not appear to be any contaminated surface or subsurface soils in the vicinity of the construction area There will not be an issue of a RCRA waste being generated during construction activities If groundwater is encountered during construction activities, it should be sampled to ensure that it does not pose a threat to construction workers

9.0 REFERENCES

DOE 1992, *Historical Release Report for the Rocky Flats Plant,* Rocky Flats Plant, Golden, CO

EG&G 1995 A, *Geologic Characterization Report for the Rocky Flats Environmental Technology Site, Volume 1 of the Sitewide Geoscience Characterization Study,* Final Report, April

EG&G 1995 B, Geochemical Characterization of Background Surface Soils Background Soils Characterization Program, Final Report, May

RMRS 1998, *RMRS Quality Assurance Program Description,* RMRS-QAPD-001, Rev 2, April

RMRS 1999, *Sampling and Analysis Plan for the Installation of a Fire Hydrant Along Tenth Street in the Protected Area*

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APPENDIX A

BOREHOLE LOGS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG

Borehole Number: B9901
Location - North: NA East: NA
Date: 8/11/99
Geologist: Paul Graham
Drilling Equip: GeoProbe

Surface Elevation NA
Area 750 PAD
Total Depth 10.0'
Company Tierra Project No TE 1015
Sample Type Push - Continuous

RMRS LOGGING SUPERVISOR
APPROVAL _____ DATE _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL (FIELD MEASUREMENT)	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	SOIL LITHOLOGIC LOG	SAMPLE DESCRIPTION
		2' Recov						0.5		Fine grained sands, brown
								1.0		Sandy Clay
								2.0		
								2.5		
								3.0		Sandy clay grading to clayey sand greyish to greyish brown
								4.0		
								5.0		
								5.0		
								6.0		
								7.0		
		2' Recov								7'-10' Sandy clay, (Brownish red) Dry
								8.0		
								9.0		
								10.0		

NOTES General. USCS is modified for this log as follows
Materials amounts are estimated by % volume instead of % weight
(1) Badly broken core accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Procedure No RMRS/OPS-PRO 101
Revision 0
Date effective 12/31/98

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG

Borehole Number: B9902
Location - North: NA East: NA
Date: 6/11/99
Geologist: Paul Graham
Drilling Equip: GeoProbe

Surface Elevation: NA
Area: 750 PAD
Total Depth: 10.0
Company: Tierra ENV. Project No: TE 1015
Sample Type: Push - Continuous

RMRS LOGGING SUPERVISOR APPROVAL _____ DATE _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL (FIELD MEASUREMENT)	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	SOIL LITHOLOGIC LOG	SAMPLE DESCRIPTION
		2' Recov						1.0, 2.0		Clayey gravel, red, some fine grained sands, fill
								3.0, 4.0, 5.0, 6.0, 7.0		Sandy clay
		2' Recov						8.0, 9.0, 10.0		Grey clay, reddish silt oxidized claystone

NOTES General: USCS is modified for this log as follows
Materials amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Procedure No RMRS/OPS-PRO 101
Revision 0
Date effective 12/31/98

(4011 930-0134-930/Form GT (A)03/01.92)

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U.S. DEPARTMENT OF ENERGY ROCKY FLATS PLANT

FORM PRO.101A

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG

PAGE 3 OF 6

Borehole Number: B9903
Location - North: NA East: NA
Date: 6/11/99
Geologist: Paul Graham
Drilling Equip: GeoProbe

Surface Elevation: NA
Area: 750 PAD
Total Depth: 10.0'
Company: Tierra ENV Project No: TE 1015
Sample Type: Push - Continuous

RMRS LOGGING SUPERVISOR APPROVAL _____ DATE _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL FIELD MEASUREMENT	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	SOIL/ LITHOLOGIC ICONS	SAMPLE DESCRIPTION
		2' Recov						1.0		Fine grained sands, reddish brown
								2.0		Grey, sandy clay
								3.0, 4.0, 5.0, 6.0, 7.0		Sandy Clay
		2' Recov						8.0, 9.0, 10.0		Brownish silty clay

NOTES General: USCS is modified for this log as follows
Materials amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Procedure No RMRS/OPS-PRO 101
Revision 0
Date effective 12/31/98

(4011 930-01 36-930) Form GT (AX03/01 V2)

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APPENDIX B-1

LABORATORY RESULTS – RAD-SCREEN

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # 99A8058#001

Page 1 of 1

Collector: HS, PG
RIN: 99A8058
Project Title: 750 PAD/Bldg 984 Geoprobe (6/11/99)
To (Lab): Thermo NuTech
Protocol:

Contact/Requester: GARCIA, ERNIE
Sampling Origin: PA – 750 PAD/Bldg 984
Logbook No.:
Method of Shipment: Hand Delivered

Telephone No.: 5980 MSIN: FAX:
Purchase Order/Charge Code: EC430500
Ice Chest No: Temp.:
Bill of Lading/Air Bill No:
Offsite Property No.:

COPY

Total Activity Exemption. Yes ☐ No ☐

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

Fax results to John Boylan (6079)

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-001 001	B-9901	SOLID	6/11/99	0926	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-003 003	B-9902	SOLID	6/11/99	0959	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-005 003	B-9903	SOLID	6/11/99	1042	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-007 003	B-9904	SOLID	6/11/99	1210	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-010 003	B-9905	SOLID	6/11/99	1317	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-012 003	B-9906	SOLID	6/11/99	1340	750 PAD	125-G G	OS01A003 (Rad-Screen - Solid) [Routine-r screen]	None None
99A8058-014 001	Equip Rinsate	AQUEOUS	6/11/99	1430	750 PAD	125-ML G	OS01A002 (RadScreen - Aqueous) [Routine-r screen]	None None

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[illegible]	6-15-99 0810	[illegible]	6/15/99 0810				

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure used in process)

Disposed By: Date/Time

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Thermo NUtech - Rocky Flats
Radscreen Results

RIN 99A8058
Analysis Radscreen
Report Date 06/15/99

Distribution/Fax ASD/ 4555
J Boylan/ 6079

Laboratory Sample ID	APO Sample ID			Matrix	Gross Alpha		Gross Beta		Total Activity	DOT
	RIN	Event	Bottle		pCi/L	2σ	pCi/L	2σ	pCi/ml	Class
99060183-07	99A8058	014	001	Water	38	84	93	142	0 36	NONRAD

DOT Classification <2000 pCi/ml total activity is NONRAD
>= 2000 pCi/ml total activity is RAD

Total Activity Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements
If the measured activity is negative 0 pCi/L (instead of the negative value) is used to calculate the total activity

Analysis Methods Sample Preparation Procedure L 6278 A, "Sample Preparation for Radiological Screening by Gas Proportional Counting"
Counting Procedure L 6295 A, "Operation of Tennelec LB4100 Gas Proportional Counters"

/Date 6/16/99
Technical Review

/Date 6/16/99
Quality Assurance Review

Thermo NUtech Rocky Flats
RFETS Building T886D
Golden, Colorado 80402
(303) 966-6860

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Thermo NUtech - Rocky Flats
Radscreen Results

RIN 99A8058
Analysis Radscreen
Report Date 06/16/99

Distribution/Fax ASD/ 4555
J Boylan/ 6079

Laboratory Sample ID	APO Sample ID			Matrix	Gross Alpha		Gross Beta		Total Activity	DOT
	RIN	Event	Bottle		pCi/g	2σ	pCi/g	2σ	pCi/g	Class
99060183-01	99A8058	001	001	Soil	19	9	42	6	76 00	NONRAD
99060183-02	99A8058	003	003	Soil	21	9	33	5	68 00	NONRAD
99060183-03	99A8058	005	003	Soil	26	8	27	5	66 00	NONRAD
99060183-04	99A8058	007	003	Soil	22	8	27	5	62 00	NONRAD
99060183-05	99A8058	010	003	Soil	23	8	31	5	67 00	NONRAD
99060183-06	99A8058	012	003	Soil	34	9	31	5	79 00	NONRAD

DOT Classification <2000 pCi/g total activity is NONRAD
>= 2000 pCi/g total activity is RAD

Total Activity Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements
If the measured activity is negative 0 pCi/g (instead of the negative value) is used to calculate the total activity

Analysis Methods Sample Preparation Procedure L-6283-A, "Sample Preparation for Radiological Screening of Soil Samples by Gas Proportional Counting"
Counting Procedure L 6295-A "Operation of Tennelec LB4100 Gas Proportional Counters"

/Date 6/16/99
Technical Review

/Date 6/16/99
Quality Assurance Review

Thermo NUtech Rocky Flats
RFETS Building T886D
Golden, Colorado 80402
(303) 966 6900

RP 0002 (11/97)

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APPENDIX B-2

LABORATORY RESULTS – VOCs and METALS

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TABLE C2 ROUTINE SW-846 METHODS

Line Item Code:		SS01B004	SS01B005	SS01B006	SS01B010
Approved Method Source[3]		SW-846 METHOD 8260 (Low Level)	SW-846 METHOD 8260	SW-846 METHOD 8260	Routine 24 Hour [4] SW-846 METHOD 8260 (Medium Level Soil Method)
Matrices:		Water, Waste Water	Water, Aqueous Waste	Soil, Sediment, Waste	Soil, Sediment
CAS #	ANALYTE	RDL[1] (ug/L)	RDL[1] (ug/L)	RDL[1] (ug/kg)	RDL[1] (ug/kg)
75-71-8	Dichlorodifluoromethane	1	5	5	1200
74-87 3	Chloromethane	1	5	5	1200
74-83-9	Bromomethane	1	5	5	1200
75-01-4	Vinyl Chloride	1	5	5	1200
75-00-3	Chloroethane	1	5	5	600
75-69-4	Trichlorofluoromethane	1	5	5	600
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	5	5	600
75-09-2	Methylene Chloride	1	5	5	600
67-64-1	Acetone	10	100	100	1200
75-15-0	Carbon Disulfide	1	5	5	600
75-35-4	1,1-Dichloroethene	1	5	5	600
75-34-3	1,1-Dichloroethane	1	5	5	600
156-60-5	trans-1,2-Dichloroethene	1	5	5	600
594-20-7	2,2-Dichloropropane	1	5	5	600
156-59-2	cis-1,2-Dichloroethene	1	5	5	600
74-97-5	Bromochloromethane	1	5	5	600
67-66-3	Chloroform	1	5	5	600
107-06-2	1,2-Dichloroethane	1	5	5	600
78-93-3	2-Butanone	10	100	100	1200
71-55-6	1 1,1-Trichloroethane	1	5	5	600
56-23-5	Carbon Tetrachloride	1	5	5	600
75-27-4	Bromodichloromethane	1	5	5	600
79-34-5	1,1,2,2-Tetrachloroethane	1	5	5	600
78-87-5	1,2-Dichloropropane	1	5	5	600
10061-02-6	trans-1,3-Dichloropropene	1	5	5	600
74-95-3	Dibromomethane	1	5	5	600
79-01-6	Trichloroethene	1	5	5	600
124-48-1	Dibromochloromethane	1	5	5	600
79-00-5	1,1,2-Trichloroethane	1	5	5	600
563-58-6	1,1-Dichloropropene	1	5	5	600
71-43-2	Benzene	1	5	5	600
10061-01-5	cis-1,3-Dichloropropene	1	5	5	600

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TABLE C2 ROUTINE SW-846 METHODS (continued)

	Line Item Code:	SS01B004	SS01B005	SS01B006	SS01B010
	Approved Method Source[2]	SW-846 METHOD 8260 (Low Level)	SW-846 METHOD 8260	SW-846 METHOD 8260	Routine 24 Hour [4] SW-846 METHOD 8260 (Medium Level Soil Method)
	Matrices:	Water, Waste Water	Water, Aqueous Waste	Soil, Sediment, Waste	Soil, Sediment
CAS #	ANALYTE	RDL[1] (ug/L)	RDL[1] (ug/L)	RDL[1] (ug/kg)	RDL[1] (ug/kg)
75-25-2	Bromoform	1	5	5	600
591-78-6	2-Hexanone	10	50	50	1200
108-10-1	4-Methyl-2-pentanone	10	50	50	1200
142-28-9	1,3-Dichloropropane	1	5	5	600
127-18-4	Tetrachloroethene	1	5	5	600
108-88-3	Toluene	1	5	5	600
108-90-7	Chlorobenzene	1	5	5	600
100-41-4	Ethylbenzene	1	5	5	600
100-42-5	Styrene	1	5	5	600
1330-20-7	Xylenes (total)	1	5	5	600
630-20-6	1,1,1,2-Tetrachloroethane	1	5	5	600
106-93-4	1,2-Dibromoethane	1	5	5	600
98-82-8	Isopropylbenzene	1	5	5	600
108-86-1	Bromobenzene	1	5	5	600
96-18-4	1,2,3-Trichloropropane	1	5	5	600
103-65-1	n-Propylbenzene	1	5	5	600
95-49-8	2-Chlorotoluene	1	5	5	600
106-43-4	4-Chlorotoluene	1	5	5	600
108-67-8	1,3,5-Trimethylbenzene	1	5	5	600
98-06-6	tert-Butylbenzene	1	5	5	600
95-63-6	1,2,4-Trimethylbenzene	1	5	5	600
135-98-8	sec-Butylbenzene	1	5	5	600
541-73-1	m-Dichlorobenzene	1	5	5	600
99-87-6	4-Isopropyltoluene	1	5	5	600
106-46-7	p-Dichlorobenzene	1	5	5	600
95-50-1	o-Dichlorobenzene	1	5	5	600
104-51-8	n-Butylbenzene	1	5	5	600
96-12-8	1,2-Dibromo-3-chloropropane	1	5	5	600
120-82-1	1,2,4-Trichlorobenzene	1	5	5	600
87-68-3	Hexachlorobutadiene	1	5	5	600
91-20-3	Naphthalene	1	5	5	600
87-61-6	1,2,3-Trichlorobenzene	1	5	5	600

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Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 8058#002

Collector PG/HS	Contact/Requester GARCIA, ERNIE	Telephone No (303) 966 5980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code IC430500
Project Title 750 PAD/B984	Logbook No	Ice Chest No Temp
To (Lab) SouthWest Lab of Oklahoma	Method of Shipment FEDEX	Bill of Lading/Air Bill No 807912276954
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** ** Samples from Borings 9901, 9902, and 9903 = 750 PAD Location
Samples from Borings 9904, 9905, and 9906 = Bldg 984 Location

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes [ ] No [ ]
PLEASE EXTRA BOTTLES HAVE PLEASE REPORT ACTIVITY OF ALL VOA'S

Bottle No	Container Number	Matrix	Date	Time	Location	Bottle Type/Container	Sample Analyses	Preservative Packing
99A8058-001 002	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-001 003	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-002 001	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-002 002	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-003 001	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-003 002	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-004 001	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[signature]	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per field procedure, used in process) Disposed By Date/Time

B23

20

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 9[illegible]8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966-5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No Typ Container	Sample Analysis	Preservative Packing
99A8058-004 002	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-005 001	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-005 002	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-006 001	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-006 002	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-007 001	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-007 002	Boring 9984, S-7	SOLID	6/11/99	1210	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-008 001	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-008 002	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-009 001	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-009 002	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph McCord	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method (e.g. Return to customer per lab procedure used in process) — Disposed By — Date/Time

B2-4

4

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 9[illegible]8058#002

RIN 99A8058

Contact/Requestor: GARCIA ERNIE

Telephone No: (303) 966 5980

MSIN

FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No Type Container	Sample Analysis	Preservative Lacking
99A8058-010 001	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-010 002	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-011 001	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-011 002	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-012 001	Boring 9906 S-12	SOLID	6/11/99	1344	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-012 002	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-013 001	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-013 002	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125 G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-014 002	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40 ML G	SS01B009 (VOA 524 2 Water) [Priority] ~~Spare~~	None 4 degs C w/zhs
99A8058-014 003	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40 ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zhs
99A8058-014 004	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40 ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zhs

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[illegible]	6-16-99 800						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

B2-5

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Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 9[illegible]8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980

MSIN

FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	Type Container	Sample Analysis	Preservative Packing
99A8058-014 005	Rinsate	AQUEOUS	4/11/99	1430	750 PAD	1 L P/G	SS05B022 (Mtls Unfiltered SW846) [Priority]	HN03 4 degrees C

Relinquished By	Date Time	Received By	Date Time	Relinquished By	Date Time	Received By	Date Time
Ralph Michael	6-16-99 1800						
Relinquished By	Date Time	Received By	Date Time	Relinquished By	Date Time	Received By	Date Time
Relinquished By	Date/Time	Received By	Date Time	Relinquished By	Date Time	Received By	Date Time
Relinquished By	Date/Time	Received By	Date Time	Relinquished By	Date Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION	Disposal Method (e.g. Return to customer, per lab procedure, used in process)	Disposed By	Date Time

B2-6

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SECTION 5 NARRATIVE

ANALYTE VOLATILE ORGANICS

RIN NUMBER 99A8058A (Episode 39048A)

SAMPLE MATRIX Thirteen soil samples

METHOD REFERENCE NUMBERS AND REVISIONS

SWLO SOP ID SWL-OV-303
REVISION # 3 1
METHOD SW846-8260B Organic Statement of Work

DESCRIPTIONS OF MATRIX INTERFERENCES

Sample 8-013-001 contained surrogates outside QC recovery limits They were within limits in the reanalysis but both sets of data are submitted to verify that the original analysis was run within holding time VBLK1 contained low level methylene chloride less than five times the PQL and low level naphthalene contamination less than the PQL VBLK 3 contained low level methylene chloride contamination less than the PQL. VBLK4 contained low level methylene chloride and low level naphthalene contamination each less than the PQL

DESCRIPTIONS OF REQUIRED DILUTIONS

None for this data set

EXPLANATIONS OF QC DEFICIENCIES

Sample 8-008-001MS and 8-008-001MSD each contained four compounds outside QC recovery limits Two compounds exceeded their RPD limits LCS1 contained three compounds and LCSD1 contained six compounds outside QC recovery limits LCS2 contained nine compounds and LCS3 contained one compound outside QC recovery limits LCS4 contained two compounds outside QC recovery limits Sample 8-013-001RE was run outside holding time ((see above)

REASONS FOR REANALYSIS

Surrogates out of QC limits (see above)

EXPLANATIONS OF ANY DEVIATIONS FROM ROUTINE PROTOCOLS

The MS/MSD on sample 8-008-001 was run as part of our laboratory QC
The LCS/LCSD QC results form is not automatically generated from our software

EXPLANATIONS FOR "N" MARKED ON "DATA REVIEW CHECKLIST"

6 a)1 Surrogates outside QC recovery limits (see above)
6 a)2 LCS/D and MS/MSD compounds out of QC limits (see above)
6 b)7 "B" flags (see above)

Note Sample names have been shortened to accommodate our processing software

82-7

SECTION 5 NARRATIVE

ANALYTE VOLATILE ORGANICS

RIN NUMBER 99A8058B (Episode 39048B)

SAMPLE MATRIX One water sample

METHOD REFERENCE NUMBERS AND REVISIONS

SWLO SOP ID SWL-OV-315
REVISION # 2 1
METHOD 524 2 Protocol

DESCRIPTIONS OF MATRIX INTERFERENCES
None for this data set

DESCRIPTIONS OF REQUIRED DILUTIONS
None for this data set

EXPLANATIONS OF QC DEFICIENCIES
FBLK1 contained one compound outside QC recovery limits

REASONS FOR REANALYSIS
None for this data set

EXPLANATIONS OF ANY DEVIATIONS FROM ROUTINE PROTOCOLS
None for this data set

EXPLANATIONS FOR "N" MARKED ON "DATA REVIEW CHECKLIST"
6 a)2 FBLK out of QC limits (see above)

Note The fortified blanks (FBLKX) are reported as LCX in the EDD due to lack of applicable syntax. Sample names may be shortened to accommodate our processing software

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # A8058#002

Collector PG/HS	Contact/Requester GARCIA, ERNIE	Telephone No (303) 966-5980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code EC430500
Project Title 750 PAD/B984	Logbook No	Ice Chest No Temp 4°C
To (Lab) SouthWest Lab of Oklahoma	Method of Shipment FEDEX	Bill of Lading/Air Bill No 807912276954
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes [ ] No [ ]
TWO EXTRA BOTTLES HAVE BEEN SENT FOR EACH AQUEOUS VOA EVENT

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Lacking
99A8058-001 002	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-001 003	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-002 001	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-002 002	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-003 001	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-003 002	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-004 001	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Kathy Mucklad	6-16-99 1800						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) Disposed By Date/Time

SWLO 6/17/99 1000

B2-9

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Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 99A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980

MSIN

FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-004 002	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125-G P/G	SS05B048, (Mtls SW846) [Priority]	None 4 degrees C
99A8058-005 001	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-005 002	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-006 001	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-006 002	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-007 001	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-007 002	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-008 001	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-008 002	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-009 001	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-009 002	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Kayle McClard	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
						[illegible] SWLO	6/17/99 1000

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer per lab procedure, used in process) — Disposed By — Date/Time

27 B2-10

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966-5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-010 001	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-010 002	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-011 001	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-011 002	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-012 001	Boring 9906 S-12	SOLID	6/11/99	1344	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-012 002	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-013 001	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-013 002	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-014 002	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority]	None 4 degs C w/zh
99A8058-014 003	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zl
99A8058-014 004	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zl

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph Medal	6-16-99 8:00						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer per lab procedure, used in process) Disposed By Date/Time

28 B2-11

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # [illegible]A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980

MSIN

FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-014 005	Rinsate	AQUEOUS	4/11/99	1430	750 PAD	1-L P/G	SS05B022 (Mtls Unfiltered SW846) [Priority]	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ryan Mulcahy	6-16-99 1800						

FINAL SAMPLE DISPOSITION — Disposal Method (e.g. Return to customer per lab procedure, used in process) — Disposed By — Date/Time

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LCS\LCSD RECOVERY REPORT

Lab Name: SWOK\AATS | Matrix. SOIL

Instrument: r | Analyst: SERETHA

LCS Analysis Date: 23-JUN-99 16·41 | LCS File id: r33389 d

LCSD Analysis Date: 23-JUN-99 21:46 | LCSD File id: r33400.d

Units Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	37 77	76	10-182
CHLOROMETHANE	50.00	34.52	69	38-130
VINYL CHLORIDE	50.00	40.40	81	34-153
BROMOMETHANE	50.00	43.38	87	16-188
CHLOROETHANE	50.00	54.24	108	28-181
TRICHLOROFLUOROMETHANE	50.00	29.20	58	46-155
1 1-DICHLOROETHENE	50.00	30.70	61	61-152
ACETONE	50.00	30.76	62	55-152
CARBON DISULFIDE	50.00	28.51	57	35-183
METHYLENE CHLORIDE	50.00	37.53	75	16-200
trans-1 2-DICHLOROETHENE	50.00	40.12	80	30-177
1 1-DICHLOROETHANE	50.00	36.51	73	48-149
2 2-DICHLOROPROPANE	50.00	45.94	92	44-135
cis-1 2-DICHLOROETHENE	50.00	43.52	87	57-139
2-BUTANONE	50.00	54.38	109	20-180
BROMOCHLOROMETHANE	50.00	36.56	-73*	81-112
CHLOROFORM	50.00	41.50	83	62-125
1 1 1-TRICHLOROETHANE	50.00	46.90	94	68-120
CARBON TETRACHLORIDE	50.00	49.95	100	48-140
1 1-DICHLOROPROPENE	50.00	49.99	100	50-141
BENZENE	50.00	49.03	98	58-133
1 2-DICHLOROETHANE	50.00	46.54	93	66-126
TRICHLOROETHENE	50.00	47.39	95	63-129
1 2-DICHLOROPROPANE	50.00	44.25	88	67-126
DIBROMOMETHANE	50.00	38.09	76	75-124
BROMODICHLOROMETHANE	50.00	40.23	80	78-116
cis-1,3-Dichloropropene	50.00	44.44	89	73-125
4-METHYL-2-PENTANONE	50.00	49.37	99	45-151
TOLUENE	50.00	46.24	92	71-119
trans-1,3-Dichloropropene	50.00	45.80	92	70-129
1 1 2-TRICHLOROETHANE	50.00	43.28	86	54-146
TETRACHLOROETHENE	50.00	47.37	95	47-153
1 3-DICHLOROPROPANE	50.00	50.24	100	82-123
2-HEXANONE	50.00	58.20	116	38-155
DIBROMOCHLOROMETHANE	50.00	46.39	93	85-121
1 2-DIBROMOETHANE	50.00	44.01	88	72-143
CHLOROBENZENE	50.00	49.73	99	81-114
1 1 1 2-TETRACHLOROETHANE	50.00	50.30	101	87-117
ETHYL BENZENE	50.00	56.31	113	74-115
m,p-XYLENES	100.00	99.86	100	71-128
o-XYLENE	50.00	49 00	98	76-120
STYRENE	50 00	49.09	98	81-118
BROMOFORM	50.00	47.23	94	77-125

Column to be used to flag recovery with an asterisk 3 4 10%

* Value outside of QC limits

82-13

30

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
ISOPROPYLBENZENE	50.00	55.01	110	73-114
BROMOBENZENE	50.00	50.64	101	81-112
1 1 2 2-TETRACHLOROETHANE	50.00	52.73	105	52-145
1 2 3-TRICHLOROPROPANE	50.00	54 38	109	73-135
n-PROPYLBENZENE	50.00	52.28	104	80-115
2-CHLOROTOLUENE	50.00	48.57	97	79-115
4-CHLOROTOLUENE	50.00	48.67	97	77-106
1 3 5-TRIMETHYLBENZENE	50.00	47.86	96	78-113
tert-BUTYLBENZENE	50.00	49.94	100	80-112
1 2 4-TRIMETHYLBENZENE	50.00	46.26	92	76-112
sec-BUTYLBENZENE	50.00	48 29	96	72-112
1 3-DICHLOROBENZENE	50.00	42.81	86	79-113
p-ISOPROPYLTOLUENE	50.00	46.11	92	78-115
1 4-DICHLOROBENZENE	50.00	42.04	84	78-111
1 2-DICHLOROBENZENE	50.00	41.92	84	83-113
n-BUTYLBENZENE	50.00	44.11	88	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	38.95	78	52-162
1 2 4-TRICHLOROBENZENE	50.00	32.95	66	32-155
HEXACHLOROBUTADIENE	50.00	34.55	69*	70-121
NAPHTHALENE	50.00	35.37	71	27-181
1 2 3-TRICHLOROBENZENE	50.00	30.46	61*	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery: 3 out of 64 outside limits

LCS\LCSD RECOVERY REPORT

Lab Name: SWOK\AATS | Matrix: SOIL

Instrument: r | Analyst: SERETHA

LCS Analysis Date: 23-JUN-99 16:41 | LCS File id: r33389 d

LCSD Analysis Date: 23-JUN-99 21:46 | LCSD File id: r33400.d

Units: Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCSD CONC.	LCSD % REC #	% RPD	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50 00	41.43	83	9	10-182
CHLOROMETHANE	50.00	46.94	94	31	38-130
VINYL CHLORIDE	50.00	42.35	85	5	34-153
BROMOMETHANE	50.00	37.21	74	16	16-188
CHLOROETHANE	50.00	59 44	119	10	28-181
TRICHLOROFLUOROMETHANE	50.00	33.80	68	16	46-155
1 1-DICHLOROETHENE	50.00	34.75	70	14	61-152
ACETONE	50.00	26.39	53*	16	55-152
CARBON DISULFIDE	50.00	29.55	59	3	35-183
METHYLENE CHLORIDE	50.00	35.90	72	4	16-200
trans-1 2-DICHLOROETHENE	50.00	40.40	81	1	30-177
1 1-DICHLOROETHANE	50.00	38.49	77	5	48-149
2 2-DICHLOROPROPANE	50.00	41.50	83	10	44-135
cis-1 2-DICHLOROETHENE	50.00	43.31	87	0	57-139
2-BUTANONE	50.00	57.84	116	6	20-180
BROMOCHLOROMETHANE	50.00	38.74	77*	5	81-112
CHLOROFORM	50.00	43.23	86	4	62-125
1 1 1-TRICHLOROETHANE	50.00	45.89	92	2	68-120
CARBON TETRACHLORIDE	50.00	46.58	93	7	48-140
1 1-DICHLOROPROPENE	50.00	49.87	100	0	50-141
BENZENE	50.00	47.87	96	2	58-133
1 2-DICHLOROETHANE	50.00	50.24	100	7	66-126
TRICHLOROETHENE	50.00	46.42	93	2	63-129
1 2-DICHLOROPROPANE	50.00	45.79	92	4	67-126
DIBROMOMETHANE	50.00	38.20	76	0	75-124
BROMODICHLOROMETHANE	50.00	40.04	80	0	78-116
cis-1,3-Dichloropropene	50.00	44.27	88	1	73-125
4-METHYL-2-PENTANONE	50.00	50.14	100	1	45-151
TOLUENE	50.00	44.87	90	2	71-119
trans-1,3-Dichloropropene	50.00	47.02	94	2	70-129
1 1 2-TRICHLOROETHANE	50.00	47.83	96	11	54-146
TETRACHLOROETHENE	50.00	47 18	94	1	47-153
1 3-DICHLOROPROPANE	50.00	56.44	113	12	82-123
2-HEXANONE	50.00	65.83	132	13	38-155
DIBROMOCHLOROMETHANE	50.00	49.35	99	6	85-121
1 2-DIBROMOETHANE	50.00	44.41	89	1	72-143
CHLOROBENZENE	50.00	51.42	103	4	81-114
1 1 1 2-TETRACHLOROETHANE	50.00	54.15	108	7	87-117
ETHYL BENZENE	50.00	51.13	102	10	74-115
m,p-XYLENES	100.00	104 46	104	4	71-128
o-XYLENE	50.00	54.32	109	11	76-120
STYRENE	50.00	53 60	107	9	81-118
BROMOFORM	50.00	49 63	99	5	77-125

Column to be used to flag recovery with an asterisk

4HI
8/6/1090 LO

* Value outside of QC limits

B2-15

32

COMPOUND	SPIKE ADDED	LCSD CONC.	LCSD % REC #	% RPD	QC LIMITS REC
ISOPROPYLBENZENE	50 00	60.40	121*	10	73-114
BROMOBENZENE	50.00	55.67	111	9	81-112
1 1 2 2-TETRACHLOROETHANE	50 00	62.73	125	17	52-145
1 2 3-TRICHLOROPROPANE	50.00	64.63	129	17	73-135
n-PROPYLBENZENE	50.00	60.13	120*	14	80-115
2-CHLOROTOLUENE	50.00	56.59	113	15	79-115
4-CHLOROTOLUENE	50.00	52.77	106	9	77-106
1 3 5-TRIMETHYLBENZENE	50.00	55.68	111	14	78-113
tert-BUTYLBENZENE	50 00	57.21	114*	13	80-112
1 2 4-TRIMETHYLBENZENE	50.00	54.28	108	16	76-112
sec-BUTYLBENZENE	50 00	57.15	114*	17	72-112
1 3-DICHLOROBENZENE	50.00	51 75	104	19	79-113
p-ISOPROPYLTOLUENE	50.00	56.05	112	20	78-115
1 4-DICHLOROBENZENE	50.00	51.11	102	19	78-111
1 2-DICHLOROBENZENE	50.00	51.89	104	21	83-113
n-BUTYLBENZENE	50.00	56.28	112	24	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	51.99	104	29	52-162
1 2 4-TRICHLOROBENZENE	50 00	45.37	91	32	32-155
HEXACHLOROBUTADIENE	50.00	48.74	97	34	70-121
NAPHTHALENE	50.00	50.09	100	34	27-181
1 2 3-TRICHLOROBENZENE	50.00	45.99	92	41	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCSD Recovery: 6 out of 64 outside limits

LCS\LCSD RECOVERY REPORT

(8)

Lab Name· SWOK\AATS | Matrix. SOIL

Instrument· b | Analyst sam

LCS Analysis Date: 23-JUN-99 18:05 | LCS File id. b3252.d

LCSD Analysis Date: 23-JUN-99 18:34 | LCSD File id· b3253 d

Units Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	51 74	103	60-140
CHLOROMETHANE	50.00	47.68	95	65-127
VINYL CHLORIDE	50.00	35.85	72	68-126
BROMOMETHANE	50.00	43.23	86	33-159
CHLOROETHANE	50.00	54.42	109	65-132
TRICHLOROFLUOROMETHANE	50.00	56.77	114	65-129
1 1-DICHLOROETHENE	50.00	48.84	98	83-116
ACETONE	50.00	20.08	40*	60-140
CARBON DISULFIDE	50.00	38.57	77	60-140
METHYLENE CHLORIDE	50.00	38.09	76*	78-124
trans-1 2-DICHLOROETHENE	50.00	46.99	94	81-117
1 1-DICHLOROETHANE	50.00	38 87	78*	82-121
2 2-DICHLOROPROPANE	50.00	39.35	79	65-128
cis-1 2-DICHLOROETHENE	50.00	49.74	99	84-115
2-BUTANONE	50.00	39.46	79	60-140
BROMOCHLOROMETHANE	50.00	48.02	96	82-119
CHLOROFORM	50.00	41.88	84*	85-116
1 1 1-TRICHLOROETHANE	50.00	42.23	84	83-116
1 1-DICHLOROPROPENE	50.00	47.12	94	60-140
CARBON TETRACHLORIDE	50.00	49.52	99	85-115
BENZENE	50.00	52.65	105	87-115
1 2-DICHLOROETHANE	50.00	41.88	84	83-123
TRICHLOROETHENE	50.00	57.30	115	87-116
1 2-DICHLOROPROPANE	50.00	46.95	94	86-119
DIBROMOMETHANE	50.00	51.57	103	80-127
BROMODICHLOROMETHANE	50.00	47.63	95	82-119
cis-1,3-Dichloropropene	50.00	47.55	95	60-140
4-METHYL-2-PENTANONE	50.00	44.24	88	60-140
TOLUENE	50.00	53.06	106	85-115
trans-1,3-Dichloropropene	50.00	46.09	92	60-140
1 1 2-TRICHLOROETHANE	50.00	50.73	101	79-129
TETRACHLOROETHENE	50.00	64.40	129*	85-114
1 3-DICHLOROPROPANE	50.00	47 17	94	79-126
2-HEXANONE	50.00	44.51	89	60-140
DIBROMOCHLOROMETHANE	50.00	55.55	111	79-126
1 2-DIBROMOETHANE	50.00	52.35	105	74-133
CHLOROBENZENE	50.00	56 46	113	86-114
1 1 1 2-TETRACHLOROETHANE	50.00	53.20	106	85-115
ETHYL BENZENE	50.00	52 27	104	88-113
m,p-XYLENES	100.00	112.41	112	86-116
o-XYLENE	50.00	54 75	110	84-115
STYRENE	50.00	56 40	113	86-116
BROMOFORM	50.00	61.22	122	69-139

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

6 HI
4 LO (3 hi 0 lo)

34

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
ISOPROPYLBENZENE	50.00	50 43	101	85-115
BROMOBENZENE	50.00	57 97	116*	85-114
1 1 2 2-TETRACHLOROETHANE	50.00	39.27	78	53-161
1 2 3-TRICHLOROPROPANE	50.00	44.06	88	64-145
n-PROPYLBENZENE	50 00	53 20	106	82-119
2-CHLOROTOLUENE	50.00	53.78	108	86-115
4-CHLOROTOLUENE	50.00	72.66	145*	83-117
1 3 5-TRIMETHYLBENZENE	50.00	49.95	100	85-116
tert-BUTYLBENZENE	50.00	49.98	100	85-116
1 2 4-TRIMETHYLBENZENE	50.00	49.52	99	85-116
sec-BUTYLBENZENE	50.00	50.52	101	85-115
1 3-DICHLOROBENZENE	50.00	56 29	112	86-112
p-ISOPROPYLTOLUENE	50.00	50 63	101	87-113
1 4-DICHLOROBENZENE	50.00	54.48	109	86-112
1 2-DICHLOROBENZENE	50.00	55.29	110	85-116
n-BUTYLBENZENE	50.00	49.21	98	84-117
1 2-DIBROMO-3-CHLOROPROPANE	50.00	35.77	72	53-158
1 2 4-TRICHLOROBENZENE	50.00	61 18	122*	85-114
HEXACHLOROBUTADIENE	50.00	62.62	125	68-136
NAPHTHALENE	50.00	54.08	108	68-137
1 2 3-TRICHLOROBENZENE	50 00	61.12	122*	83-117

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery: 9 out of 64 outside limits

LCS\LCSD RECOVERY REPORT

(3)

Lab Name: SWOK\AATS | Matrix SOIL

Instrument: r | Analyst SERETHA

LCS Analysis Date. 25-JUN-99 11 47 | LCS File id r33420 d

~~LCSD Analysis Date. 25-JUN-99 18·27 | LCSD File id. r33432 d~~

Units Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50 00	42.92	86	10-182
CHLOROMETHANE	50 00	43 61	87	38-130
VINYL CHLORIDE	50.00	46.83	94	34-153
BROMOMETHANE	50.00	53.67	107	16-188
CHLOROETHANE	50.00	65 85	132	28-181
TRICHLOROFLUOROMETHANE	50.00	59 45	119	46-155
~~ACROLEIN~~	~~500.00~~	~~1357.99~~	~~272*~~	~~10-185~~
1 1-DICHLOROETHENE	50.00	38 43	77	61-152
ACETONE	50.00	31.63	63	55-152
CARBON DISULFIDE	50 00	25.95	52	35-183
METHYLENE CHLORIDE	50.00	40 44	81	16-200
ACRYLONITRILE	500 00	450 46	90	10-219
trans-1 2-DICHLOROETHENE	50.00	36 07	72	30-177
Methyl-tert-Butyl Ether	50 00	48 29	96	53-111
1 1-DICHLOROETHANE	50.00	38 52	77	48-149
VINYL ACETATE	50.00	30 41	61	43-141
2 2-DICHLOROPROPANE	50.00	31.25	62	44-135
cis-1 2-DICHLOROETHENE	50.00	38.60	77	57-139
2-BUTANONE	50.00	56.37	113	20-180
BROMOCHLOROMETHANE	50.00	37.73	75*	81-112
CHLOROFORM	50.00	39.16	78	62-125
1 1 1-TRICHLOROETHANE	50.00	40.99	82	68-120
CARBON TETRACHLORIDE	50.00	38 53	77	48-140
1 1-DICHLOROPROPENE	50.00	39 99	80	50-141
BENZENE	50.00	41.17	82	58-133
1 2-DICHLOROETHANE	50.00	44.85	90	66-126
TRICHLOROETHENE	50.00	43 82	88	63-129
1 2-DICHLOROPROPANE	50.00	46 06	92	67-126
DIBROMOMETHANE	50.00	39.14	78	75-124
BROMODICHLOROMETHANE	50 00	42.54	85	78-116
2-CHLOROETHYL VINYL ETHER	50.00	61 72	123	39-134
cis-1,3-Dichloropropene	50.00	43 17	86	73-125
4-METHYL-2-PENTANONE	50.00	54 29	108	45-151
TOLUENE	50 00	43 03	86	71-119
trans-1,3-Dichloropropene	50 00	44 66	89	70-129
1 1 2-TRICHLOROETHANE	50 00	49 10	98	54-146
TETRACHLOROETHENE	50.00	42 70	85	47-153
1 3-DICHLOROPROPANE	50 00	55 52	111	82-123
2-HEXANONE	50.00	66 64	133	38-155
DIBROMOCHLOROMETHANE	50 00	50 54	101	85-121
1 2-DIBROMOETHANE	50 00	46 57	93	72-143
CHLOROBENZENE	50.00	49 76	100	81-114
1-CHLOROHEXANE	50 00	38 91	78	22-151

Column to be used to flag recovery with an asterisk

1 10/(1080)

• Value outside of QC limits

36

(3)

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
1 1 1 2-TETRACHLOROETHANE	50 00	52 71	105	87-117
ETHYL BENZENE	50 00	49 84	100	74-115
m,p-XYLENES	100 00	98 40	98	71-128
o-XYLENE	50 00	51 59	103	76-120
STYRENE	50 00	51 07	102	81-118
BROMOFORM	50 00	51 13	102	77-125
ISOPROPYLBENZENE	50 00	52 96	106	73-114
BROMOBENZENE	50 00	53 91	108	81-112
1 1 2 2-TETRACHLOROETHANE	50 00	59 76	120	52-145
1 2 3-TRICHLOROPROPANE	50 00	58 48	117	73-135
n-PROPYLBENZENE	50 00	52 38	105	80-115
2-CHLOROTOLUENE	50 00	53 72	107	79-115
4-CHLOROTOLUENE	50 00	48 16	96	77-106
1 3 5-TRIMETHYLBENZENE	50 00	49 21	98	78-113
tert-BUTYLBENZENE	50 00	51 59	103	80-112
1 2 4-TRIMETHYLBENZENE	50 00	48 22	96	76-112
sec-BUTYLBENZENE	50 00	50.08	100	72-112
1 3-DICHLOROBENZENE	50 00	48 43	97	79-113
p-ISOPROPYLTOLUENE	50 00	47 84	96	78-115
1 4-DICHLOROBENZENE	50 00	46 99	94	78-111
1 2-DICHLOROBENZENE	50 00	50.59	101	83-113
n-BUTYLBENZENE	50 00	46 21	92	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	50 14	100	52-162
1 2 4-TRICHLOROBENZENE	50.00	37.45	75	32-155
HEXACHLOROBUTADIENE	50 00	41.93	84	70-121
NAPHTHALENE	50 00	46.95	94	27-181
1 2 3-TRICHLOROBENZENE	50.00	39.63	79	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery· 2 out of 70 outside limits

B7-20

37

LCS\LCSD RECOVERY REPORT

(A)

Lab Name SWOK\AATS | Matrix SOIL

Instrument r | Analyst SERETHA

LCS Analysis Date 29-JUN-99 12 42 | LCS File id. r33472.d

Units· Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	50.00	30 47	61	10-182
CHLOROMETHANE	50 00	29 69	59	38-130
VINYL CHLORIDE	50 00	29 78	60	34-153
BROMOMETHANE	50.00	36 84	74	16-188
CHLOROETHANE	50.00	35 01	70	28-181
TRICHLOROFLUOROMETHANE	50.00	48 61	97	46-155
~~ACROLEIN~~	~~500.00~~	~~1630.01~~	~~326*~~	~~10-185~~
1 1-DICHLOROETHENE	50.00	35.15	70	61-152
ACETONE	50.00	51 80	104	55-152
CARBON DISULFIDE	50.00	30.28	60	35-183
METHYLENE CHLORIDE	50.00	38 51	77	16-200
ACRYLONITRILE	500.00	397 18	79	10-219
trans-1 2-DICHLOROETHENE	50.00	46 79	94	30-177
Methyl-tert-Butyl Ether	50.00	43 73	87	53-111
1 1-DICHLOROETHANE	50.00	34 43	69	48-149
VINYL ACETATE	50.00	42 27	84	43-141
2 2-DICHLOROPROPANE	50.00	43.97	88	44-135
cis-1 2-DICHLOROETHENE	50.00	42 67	85	57-139
2-BUTANONE	50.00	56.11	112	20-180
BROMOCHLOROMETHANE	50.00	39.20	- 78*	81-112
CHLOROFORM	50.00	41.23	82	62-125
1 1 1-TRICHLOROETHANE	50.00	46.68	93	68-120
CARBON TETRACHLORIDE	50.00	53 83	108	48-140
1 1-DICHLOROPROPENE	50.00	50.86	102	50-141
BENZENE	50.00	48.64	- 97	58-133
1 2-DICHLOROETHANE	50.00	49 30	99	66-126
TRICHLOROETHENE	50.00	49.57	99	63-129
1 2-DICHLOROPROPANE	50.00	44.08	88	67-126
DIBROMOMETHANE	50.00	45 85	92	75-124
BROMODICHLOROMETHANE	50.00	49 10	98	78-116
2-CHLOROETHYL VINYL ETHER	50 00	37 65	75	39-134
cis-1,3-Dichloropropene	50.00	48 76	98	73-125
4-METHYL-2-PENTANONE	50.00	54 42	109	45-151
TOLUENE	50.00	51 17 -	102	71-119
trans-1,3-Dichloropropene	50.00	50 16	100	70-129
1 1 2-TRICHLOROETHANE	50 00	49.45	99	54-146
TETRACHLOROETHENE	50.00	53 77	108	47-153
1 3-DICHLOROPROPANE	50 00	51.84	104	82-123
2-HEXANONE	50 00	70.52	141	38-155
DIBROMOCHLOROMETHANE	50.00	52.70	105	85-121
1 2-DIBROMOETHANE	50 00	55 68	111	72-143
CHLOROBENZENE	50.00	53 25	106	81-114
1-CHLOROHEXANE	50 00	38 15	76	22-151

Column to be used to flag recovery with an asterisk

• Value outside of QC limits

ϕ BTEX

8260 1H1 1510920

BZ-21

38

(4)

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
1 1 1 2-TETRACHLOROETHANE	50.00	56.71	113	87-117
ETHYL BENZENE	50 00	51 20	102	74-115
m,p-XYLENES	100 00	99 51	100	71-128
o-XYLENE	50 00	52 44	105	76-120
STYRENE	50 00	53 15	106	81-118
BROMOFORM	50 00	55.47	111	77-125
ISOPROPYLBENZENE	50 00	55.24	110	73-114
BROMOBENZENE	50 00	57.16	114*	81-112
1 1 2 2-TETRACHLOROETHANE	50 00	58.23	116	52-145
1 2 3-TRICHLOROPROPANE	50.00	57 96	116	73-135
n-PROPYLBENZENE	50.00	54.95	110	80-115
2-CHLOROTOLUENE	50 00	53 22	106	79-115
4-CHLOROTOLUENE	50.00	51 05	102	77-106
1 3 5-TRIMETHYLBENZENE	50.00	52.08	104	78-113
tert-BUTYLBENZENE	50 00	53.64	107	80-112
1 2 4-TRIMETHYLBENZENE	50.00	51 94	104	76-112
sec-BUTYLBENZENE	50 00	52.77	106	72-112
1 3-DICHLOROBENZENE	50 00	52 42	105	79-113
p-ISOPROPYLTOLUENE	50.00	52.35	105	78-115
1 4-DICHLOROBENZENE	50 00	49.58	99	78-111
1 2-DICHLOROBENZENE	50.00	50 84	102	83-113
n-BUTYLBENZENE	50.00	50.64	101	73-118
1 2-DIBROMO-3-CHLOROPROPANE	50.00	47 18	94	52-162
1 2 4-TRICHLOROBENZENE	50.00	51.38	103	32-155
HEXACHLOROBUTADIENE	50.00	52.30	105	70-121
NAPHTHALENE	50.00	49.09	98	27-181
1 2 3-TRICHLOROBENZENE	50.00	50.30	101	68-127

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery. 3 out of 70 outside limits

82-22

39

LCS\LCSD RECOVERY REPORT

Lab Name· SWOK\AATS | Matrix WATER

Instrument. n | Analyst seretha

LCS Analysis Date· 25-JUN-99 15·43 | LCS File id n35462 d

Units· Water ug/L Soil ug/Kg Air ppbv

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
DICHLORODIFLUOROMETHANE	1 00	0 84	84	70-130
CHLOROMETHANE	1.00	0 94	94	70-130
VINYL CHLORIDE	1 00	0 84	84	70-130
BROMOMETHANE	1.00	0 98	98	70-130
CHLOROETHANE	1 00	0 83	83	70-130
TRICHLOROFLUOROMETHANE	1 00	0 82	82	70-130
1 1-DICHLOROETHENE	1.00	0 82	82	70-130
METHYLENE CHLORIDE	1.00	1 75	175*	70-130
trans-1 2-DICHLOROETHENE	1.00	0 87	87	70-130
1 1-DICHLOROETHANE	1.00	0 97	97	70-130
2 2-DICHLOROPROPANE	1.00	1 01	101	70-130
cis-1 2-DICHLOROETHENE	1.00	0 95	95	70-130
BROMOCHLOROMETHANE	1.00	0 91	91	70-130
CHLOROFORM	1.00	1.00	100	70-130
1 1 1-TRICHLOROETHANE	1.00	0 92	92	70-130
CARBON TETRACHLORIDE	1.00	0.87	87	70-130
1 1-DICHLOROPROPENE	1.00	0 98	98	70-130
BENZENE	1.00	1.05	105	70-130
1 2-DICHLOROETHANE	1.00	1 03	103	70-130
TRICHLOROETHENE	1.00	0.93	93	70-130
1 2-DICHLOROPROPANE	1.00	0.92	92	70-130
DIBROMOMETHANE	1.00	0.98	98	70-130
BROMODICHLOROMETHANE	1.00	0.88	88	70-130
cis-1,3-DICHLOROPROPENE	1.00	0.87	87	70-130
TOLUENE	1 00	0.97	97	70-130
trans-1,3-DICHLOROPROPENE	1 00	0.84	84	70-130
1 1 2-TRICHLOROETHANE	1.00	0 95	95	70-130
TETRACHLOROETHENE	1.00	0 92	92	70-130
1 3-DICHLOROPROPANE	1 00	0.94	94	70-130
DIBROMOCHLOROMETHANE	1.00	0.83	83	70-130
1 2-DIBROMOETHANE	1.00	0 93	93	70-130
CHLOROBENZENE	1 00	0 92	92	70-130
1 1 1 2-TETRACHLOROETHANE	1.00	0.92	92	70-130
ETHYL BENZENE	1.00	0 96	96	70-130
m,p-XYLENES	2 00	1 91	96	70-130
o-XYLENE	1.00	0 95	95	70-130
STYRENE	1 00	0.88	88	70-130
BROMOFORM	1 00	0 74	74	70-130
ISOPROPYLBENZENE	1.00	0.92	92	70-130
BROMOBENZENE	1 00	0.87	87	70-130
1 2 3-TRICHLOROPROPANE	1 00	1 16	116	70-130
1 1 2 2-TETRACHLOROETHANE	1 00	0 88	88	70-130
n-PROPYLBENZENE	1 00	0 88	88	70-130

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

COMPOUND	SPIKE ADDED	LCS CONCENTRATION	LCS % REC #	QC LIMITS REC
2-CHLOROTOLUENE	1 00	0 85	85	70-130
4-CHLOROTOLUENE	1 00	0.95	95	70-130
1 3 5-TRIMETHYLBENZENE	1.00	0 94	94	70-130
tert-BUTYLBENZENE	1 00	0 82	82	70-130
1 2 4-TRIMETHYLBENZENE	1 00	0 90	90	70-130
sec-BUTYLBENZENE	1.00	0 94	94	70-130
1 3-DICHLOROBENZENE	1.00	0.87	87	70-130
1 4-DICHLOROBENZENE	1.00	0 96	96	70-130
p-ISOPROPYLTOLUENE	1 00	0 91	91	70-130
1 2-DICHLOROBENZENE	1 00	0 88	88	70-130
n-BUTYLBENZENE	1 00	0.88	88	70-130
1 2-DIBROMO-3-CHLOROPROPANE	1 00	0 72	72	70-130
1 2 4-TRICHLOROBENZENE	1 00	0 70	70	70-130
NAPHTHALENE	1 00	0.71	71	70-130
HEXACHLOROBUTADIENE	1 00	0 84	84	70-130
1 2 3-TRICHLOROBENZENE	1 00	0.72	72	70-130

Column to be used to flag recovery with an asterisk

* Value outside of QC limits

LCS Recovery 1 out of 59 outside limits

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

8058-014-002

Lab Name SWL-TULSA Contract 99A8058B

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048B

Lab Sample ID 39048 27 Lab File ID N35464 D

Purge Volume 25 0 mL Date Received. 06/17/99

Matrix WATER Date Analyzed 06/25/99

GC Column DB624 ID 0 53 (mm) Dilution Factor 1.0

CAS NO.	COMPOUND	CONCENTRATION ug/L	Q
74-87-3	CHLOROMETHANE	1	U
74-83-9	BROMOMETHANE	1	U
75-01-4	VINYL CHLORIDE	1	U
75-00-3	CHLOROETHANE	1	U
75-09-2	METHYLENE CHLORIDE	1	U
75-35-4	1 1-DICHLOROETHENE	1	U
75-34-3	1 1-DICHLOROETHANE	1	U
67-66-3	CHLOROFORM	1	U
107-06-2	1 2-DICHLOROETHANE	1	U
71-55-6	1 1 1-TRICHLOROETHANE	1	U
56-23-5	CARBON TETRACHLORIDE	1	U
75-27-4	BROMODICHLOROMETHANE	1	U
78-87-5	1 2-DICHLOROPROPANE	1	U
10061-01-5	cis-1,3-DICHLOROPROPENE	1	U
79-01-6	TRICHLOROETHENE	1	U
124-48-1	DIBROMOCHLOROMETHANE	1	U
79-00-5	1 1 2-TRICHLOROETHANE	1	U
71-43-2	BENZENE	1	U
10061-02-6	trans-1,3-DICHLOROPROPENE	1	U
75-25-2	BROMOFORM	1	U
127-18-4	TETRACHLOROETHENE	1	U
108-88-3	TOLUENE	1	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	1	U
108-90-7	CHLOROBENZENE	1	U
100-41-4	ETHYL BENZENE	1	U
100-42-5	STYRENE	1	U
1330-20-7	Xylene (total)	1	U
156-59-2	cis-1 2-DICHLOROETHENE	1	U
156-60-5	trans-1 2-DICHLOROETHENE	1	U
106-93-4	1 2-DIBROMOETHANE	1	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	1	U
75-71-8	DICHLORODIFLUOROMETHANE	1	U
75-69-4	TRICHLOROFLUOROMETHANE	1	U
74-95-3	DIBROMOMETHANE	1	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	1	U
108-86-1	BROMOBENZENE	1	U
104-51-8	n-BUTYLBENZENE	1	U
98-06-6	tert-BUTYLBENZENE	1	U
135-98-8	sec-BUTYLBENZENE	1	U
95-49-8	2-CHLOROTOLUENE	1	U
106-43-4	4-CHLOROTOLUENE	1	U

82-25

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

8058-014-002

Lab Name SWL-TULSA Contract 99A8058B

Lab Code SWOK Case No · KAISHIL SAS No SDG No 39048B

Lab Sample ID 39048 27 Lab File ID N35464 D

Purge Volume 25 0 mL Date Received 06/17/99

Matrix WATER Date Analyzed 06/25/99

GC Column DB624 ID 0 53 (mm) Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION ug/L	Q
95-50-1	1 2-DICHLOROBENZENE	1	U
541-73-1	1 3-DICHLOROBENZENE	1	U
106-46-7	1 4-DICHLOROBENZENE	1	U
142-28-9	1 3-DICHLOROPROPANE	1	U
590-20-7	2 2-DICHLOROPROPANE	1	U
563-58-6	1 1-DICHLOROPROPENE	1	U
87-68-3	HEXACHLOROBUTADIENE	1	U
98-82-8	ISOPROPYLBENZENE	1	U
99-87-6	p-ISOPROPYLTOLUENE	1	U
91-20-3	NAPHTHALENE	1	U
103-65-1	n-PROPYLBENZENE	1	U
87-61-6	1 2 3-TRICHLOROBENZENE	1	U
120-82-1	1 2 4-TRICHLOROBENZENE	1	U
96-18-4	1 2 3-TRICHLOROPROPANE	1	U
95-63-6	1 2 4-TRIMETHYLBENZENE	1	U
108-67-8	1 3 5-TRIMETHYLBENZENE	1	U
74-97-5	BROMOCHLOROMETHANE	1	U

B7-76

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4901-51

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-001-002

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 01

Sample wt/vol 5 0 (g/mL) G Lab File ID R33422 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 10 Date Analyzed 06/25/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	5	JB
67-64-1	ACETONE	6	U
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

82-27

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99C-51

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-001-002

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 01

Sample wt/vol 5 0 (g/mL) G Lab File ID R33422 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 10 Date Analyzed 06/25/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	1	J
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B7-28

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9901-51

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-001-002

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix· (soil/water) SOIL Lab Sample ID 39048 01

Sample wt/vol 5 0 (g/mL) G Lab File ID R33422 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 10 Date Analyzed 06/25/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 2

CONCENTRATION UNITS
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1		UNKNOWN	19 271	23	JB
2		UNKNOWN	21 458	31	JB
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
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21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

46

82-29

9801-S-2

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-002-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 02

Sample wt/vol 5 0 (g/mL) G Lab File ID R33392 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 14 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	8	B
67-64-1	ACETONE	14	
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	6	U
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

B2-30

9901 5-2

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-002-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 02

Sample wt/vol 5 0 (g/mL) G Lab File ID R33392 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 14 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

B7-31

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9901 5-2

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-002-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 02

Sample wt/vol 5 0 (g/mL) G Lab File ID R33392 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 14 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 3

CONCENTRATION UNITS
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	17 003	7	J
2	UNKNOWN	19 318	28	JB
3	UNKNOWN	21 505	14	J
4				
5				
6				
7				
8				
9				
10				
11				
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B2-32

9902-5-3

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-003-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 03

Sample wt/vol 5 0 (g/mL) G Lab File ID R33393 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 6 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	5	U
74-83-9	BROMOMETHANE	5	U
75-01-4	VINYL CHLORIDE	5	U
75-00-3	CHLOROETHANE	5	U
75-09-2	METHYLENE CHLORIDE	3	JB
67-64-1	ACETONE	5	U
75-15-0	CARBON DISULFIDE	5	U
75-35-4	1 1-DICHLOROETHENE	5	U
75-34-3	1 1-DICHLOROETHANE	5	U
67-66-3	CHLOROFORM	5	U
107-06-2	1 2-DICHLOROETHANE	5	U
78-93-3	2-BUTANONE	5	U
71-55-6	1 1 1-TRICHLOROETHANE	5	U
56-23-5	CARBON TETRACHLORIDE	5	U
75-27-4	BROMODICHLOROMETHANE	5	U
78-87-5	1 2-DICHLOROPROPANE	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	TRICHLOROETHENE	5	U
124-48-1	DIBROMOCHLOROMETHANE	5	U
79-00-5	1 1 2-TRICHLOROETHANE	5	U
71-43-2	BENZENE	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	BROMOFORM	5	U
108-10-1	4-METHYL-2-PENTANONE	5	U
591-78-6	2-HEXANONE	5	U
127-18-4	TETRACHLOROETHENE	5	U
108-88-3	TOLUENE	5	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	5	U
108-90-7	CHLOROBENZENE	5	U
100-41-4	ETHYL BENZENE	5	U
100-42-5	STYRENE	5	U
1330-20-7	Xylene (Total)	5	U
156-59-2	cis-1 2-DICHLOROETHENE	5	U
156-60-5	trans-1 2-DICHLOROETHENE	5	U

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9902 5-3

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-003-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 03

Sample wt/vol 5 0 (g/mL) G Lab File ID R33393 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 6 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS. (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	5	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	5	U
96-18-4	1 2 3-TRICHLOROPROPANE	5	U
75-71-8	DICHLORODIFLUOROMETHANE	5	U
75-69-4	TRICHLOROFLUOROMETHANE	5	U
74-95-3	DIBROMOMETHANE	5	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	5	U
108-86-1	BROMOBENZENE	5	U
104-51-8	n-BUTYLBENZENE	5	U
98-06-6	tert-BUTYLBENZENE	5	U
135-98-8	sec-BUTYLBENZENE	5	U
95-49-8	2-CHLOROTOLUENE	5	U
106-43-4	4-CHLOROTOLUENE	5	U
95-50-1	1 2-DICHLOROBENZENE	5	U
541-73-1	1 3-DICHLOROBENZENE	5	U
106-46-7	1 4-DICHLOROBENZENE	5	U
142-28-9	1 3-DICHLOROPROPANE	5	U
594-20-7	2 2-DICHLOROPROPANE	5	U
563-58-6	1 1-DICHLOROPROPENE	5	U
87-68-3	HEXACHLOROBUTADIENE	5	U
98-82-8	ISOPROPYLBENZENE	5	U
99-87-6	p-ISOPROPYLTOLUENE	5	U
91-20-3	NAPHTHALENE	5	U
103-65-1	n-PROPYLBENZENE	5	U
87-61-6	1 2 3-TRICHLOROBENZENE	5	U
120-82-1	1 2 4-TRICHLOROBENZENE	5	U
95-63-6	1 2 4-TRIMETHYLBENZENE	5	U
108-67-8	1 3 5-TRIMETHYLBENZENE	5	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	5	U
74-97-5	BROMOCHLOROMETHANE	5	U

B2-34

9902 5-3

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-003-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 03

Sample wt/vol 5 0 (g/mL) G Lab File ID R33393 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 6 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 4

CONCENTRATION UNITS
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	17 004	7	J
2	UNKNOWN	19 313	35	JB
3	UNKNOWN	21 499	6	J
4	UNKNOWN	21 529	6	J
5				
6				
7				
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9902-5-4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO
8-004-001

Lab Name SWL-TULSA Contract· 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 04

Sample wt/vol 5 0 (g/mL) G Lab File ID R33394 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 17 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor· 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS· (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	4	JB
67-64-1	ACETONE	30	
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	18	
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

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9902 S-4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-004-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No. 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 04

Sample wt/vol 5 0 (g/mL) G Lab File ID R33394 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 17 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	2	J
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

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9902 5-4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-004-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 04

Sample wt/vol 5 0 (g/mL) G Lab File ID R33394 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 17 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1.0

Number TICs found 3

CONCENTRATION UNITS.
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST - CONC	Q
1		UNKNOWN	16 991	9	J
2		UNKNOWN	19 312	44	JB
3		UNKNOWN	21 529	20	J
4					
5					
6					
7					
8					
9					
10					
11					
12					
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EPA SAMPLE NO

8-005-001

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 05

Sample wt/vol 5 0 (g/mL) G Lab File ID R33395 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 1 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	5	U
74-83-9	BROMOMETHANE	5	U
75-01-4	VINYL CHLORIDE	5	U
75-00-3	CHLOROETHANE	5	U
75-09-2	METHYLENE CHLORIDE	4	JB
67-64-1	ACETONE	6	
75-15-0	CARBON DISULFIDE	5	U
75-35-4	1 1-DICHLOROETHENE	5	U
75-34-3	1 1-DICHLOROETHANE	5	U
67-66-3	CHLOROFORM	5	U
107-06-2	1 2-DICHLOROETHANE	5	U
78-93-3	2-BUTANONE	5	U
71-55-6	1 1 1-TRICHLOROETHANE	5	U
56-23-5	CARBON TETRACHLORIDE	5	U
75-27-4	BROMODICHLOROMETHANE	5	U
78-87-5	1 2-DICHLOROPROPANE	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	TRICHLOROETHENE	5	U
124-48-1	DIBROMOCHLOROMETHANE	5	U
79-00-5	1 1 2-TRICHLOROETHANE	5	U
71-43-2	BENZENE	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	BROMOFORM	5	U
108-10-1	4-METHYL-2-PENTANONE	5	U
591-78-6	2-HEXANONE	5	U
127-18-4	TETRACHLOROETHENE	5	U
108-88-3	TOLUENE	5	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	5	U
108-90-7	CHLOROBENZENE	5	U
100-41-4	ETHYL BENZENE	5	U
100-42-5	STYRENE	5	U
1330-20-7	Xylene (Total)	5	U
156-59-2	cis-1 2-DICHLOROETHENE	5	U
156-60-5	trans-1 2-DICHLOROETHENE	5	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-005-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 05

Sample wt/vol 5 0 (g/mL) G Lab File ID R33395 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 1 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	5	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	5	U
96-18-4	1 2 3-TRICHLOROPROPANE	5	U
75-71-8	DICHLORODIFLUOROMETHANE	5	U
75-69-4	TRICHLOROFLUOROMETHANE	5	U
74-95-3	DIBROMOMETHANE	5	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	5	U
108-86-1	BROMOBENZENE	5	U
104-51-8	n-BUTYLBENZENE	5	U
98-06-6	tert-BUTYLBENZENE	5	U
135-98-8	sec-BUTYLBENZENE	5	U
95-49-8	2-CHLOROTOLUENE	5	U
106-43-4	4-CHLOROTOLUENE	5	U
95-50-1	1 2-DICHLOROBENZENE	5	U
541-73-1	1 3-DICHLOROBENZENE	5	U
106-46-7	1 4-DICHLOROBENZENE	5	U
142-28-9	1 3-DICHLOROPROPANE	5	U
594-20-7	2 2-DICHLOROPROPANE	5	U
563-58-6	1 1-DICHLOROPROPENE	5	U
87-68-3	HEXACHLOROBUTADIENE	5	U
98-82-8	ISOPROPYLBENZENE	5	U
99-87-6	p-ISOPROPYLTOLUENE	5	U
91-20-3	NAPHTHALENE	5	U
103-65-1	n-PROPYLBENZENE	5	U
87-61-6	1 2 3-TRICHLOROBENZENE	5	U
120-82-1	1 2 4-TRICHLOROBENZENE	5	U
95-63-6	1 2 4-TRIMETHYLBENZENE	5	U
108-67-8	1 3 5-TRIMETHYLBENZENE	5	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	5	U
74-97-5	BROMOCHLOROMETHANE	5	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

8-005-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 05

Sample wt/vol 5 0 (g/mL) G Lab File ID R33395 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 1 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column (pack/cap) CAP Dilution Factor 1 0

Number TICs found 3

CONCENTRATION UNITS
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST _ CONC.	Q
1	Cyclotrisiloxane	9 080	6	J
2	UNKNOWN	19 312	25	JB
3	UNKNOWN	21 511	9	J
4				
5.				
6				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-006-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 06

Sample wt/vol 5 0 (g/mL) G Lab File ID R33396 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 13 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
74-87-3	CHLOROMETHANE	6	U
74-83-9	BROMOMETHANE	6	U
75-01-4	VINYL CHLORIDE	6	U
75-00-3	CHLOROETHANE	6	U
75-09-2	METHYLENE CHLORIDE	3	JB
67-64-1	ACETONE	21	
75-15-0	CARBON DISULFIDE	6	U
75-35-4	1 1-DICHLOROETHENE	6	U
75-34-3	1 1-DICHLOROETHANE	6	U
67-66-3	CHLOROFORM	6	U
107-06-2	1 2-DICHLOROETHANE	6	U
78-93-3	2-BUTANONE	13	
71-55-6	1 1 1-TRICHLOROETHANE	6	U
56-23-5	CARBON TETRACHLORIDE	6	U
75-27-4	BROMODICHLOROMETHANE	6	U
78-87-5	1 2-DICHLOROPROPANE	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	TRICHLOROETHENE	6	U
124-48-1	DIBROMOCHLOROMETHANE	6	U
79-00-5	1 1 2-TRICHLOROETHANE	6	U
71-43-2	BENZENE	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	BROMOFORM	6	U
108-10-1	4-METHYL-2-PENTANONE	6	U
591-78-6	2-HEXANONE	6	U
127-18-4	TETRACHLOROETHENE	6	U
108-88-3	TOLUENE	6	U
79-34-5	1 1 2 2-TETRACHLOROETHANE	6	U
108-90-7	CHLOROBENZENE	6	U
100-41-4	ETHYL BENZENE	6	U
100-42-5	STYRENE	6	U
1330-20-7	Xylene (Total)	6	U
156-59-2	cis-1 2-DICHLOROETHENE	6	U
156-60-5	trans-1 2-DICHLOROETHENE	6	U

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9903 5-6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

8-006-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 06

Sample wt/vol 5 0 (g/mL) G Lab File ID R33396 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 13 Date Analyzed 06/23/99

Column (pack/cap) CAP Dilution Factor 1 0

CAS NO	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/KG	Q
106-93-4	1 2-DIBROMOETHANE	6	U
630-20-6	1 1 1 2-TETRACHLOROETHANE	6	U
96-18-4	1 2 3-TRICHLOROPROPANE	6	U
75-71-8	DICHLORODIFLUOROMETHANE	6	U
75-69-4	TRICHLOROFLUOROMETHANE	6	U
74-95-3	DIBROMOMETHANE	6	U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	6	U
108-86-1	BROMOBENZENE	6	U
104-51-8	n-BUTYLBENZENE	6	U
98-06-6	tert-BUTYLBENZENE	6	U
135-98-8	sec-BUTYLBENZENE	6	U
95-49-8	2-CHLOROTOLUENE	6	U
106-43-4	4-CHLOROTOLUENE	6	U
95-50-1	1 2-DICHLOROBENZENE	6	U
541-73-1	1 3-DICHLOROBENZENE	6	U
106-46-7	1 4-DICHLOROBENZENE	6	U
142-28-9	1 3-DICHLOROPROPANE	6	U
594-20-7	2 2-DICHLOROPROPANE	6	U
563-58-6	1 1-DICHLOROPROPENE	6	U
87-68-3	HEXACHLOROBUTADIENE	6	U
98-82-8	ISOPROPYLBENZENE	6	U
99-87-6	p-ISOPROPYLTOLUENE	6	U
91-20-3	NAPHTHALENE	6	U
103-65-1	n-PROPYLBENZENE	6	U
87-61-6	1 2 3-TRICHLOROBENZENE	6	U
120-82-1	1 2 4-TRICHLOROBENZENE	6	U
95-63-6	1 2 4-TRIMETHYLBENZENE	6	U
108-67-8	1 3 5-TRIMETHYLBENZENE	6	U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHA	6	U
74-97-5	BROMOCHLOROMETHANE	6	U

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9903 S-6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

8-006-001

Lab Name SWL-TULSA Contract 99A8058A

Lab Code SWOK Case No KAISHIL SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 06

Sample wt/vol 5.0 (g/mL) G Lab File ID R33396 D

Level (low/med) LOW Date Received 06/17/99

% Moisture not dec 13 Date Analyzed 06/23/99

Soil Extract Volume _____(uL) Soil Aliquot Volume _____(uL)

Column· (pack/cap) CAP Dilution Factor 1 0

Number TICs found 2

CONCENTRATION UNITS
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST CONC	Q
1	UNKNOWN	19 312	28	JB
2	UNKNOWN	21 516	19	J
3				
4				
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SECTION 5

SDG NARRATIVE: INORGANIC METALS FRACTION

RIN #:	99A8058
SWLO SDG:	39048A(soils) & 39048B(water)
PSA MODULE:	SS05-C
REPORT DATE:	July 1, 1999

Thirteen soil samples and one water sample was submitted for ICP analysis. No major problems occurred during the digestion or analysis of these samples.

METHOD REFERENCE NUMBERS AND REVISIONS:
The samples were analyzed according to the following SWLO procedures and in accordance to specifications in SS05-C:

SWL SOP #	Method SOP is based	SWLO Batch ID
SWL-IN-205	SW846 3010A, 3050A & 6010B	990622I1(soils) & 990622I2(water)

DESCRIPTION OF MATRIX INTERFERENCE:
Possible matrix interference was observed for the soil samples due to an "N" flag required for Antimony and Calcium and a "*" flag required for Calcium. The water sample did not observe any matrix interferences.

DESCRIPTION OF REQUIRED DILUTION'S:
Dilutions were not required.

Site Sample Numbers Used for QC
The cover page of the Inorganic Analysis Data Package indicates the Site Sample Numbers used for Quality Control as well as a cross reference to the SWLO ID number.

EXPLANATION OF QC DEFICIENCIES:
All QC samples were within the specified control limits for this data group. RDL-3 requirements were met for all parameters. There were no hold time violations. Prep QC consisted of a prep blank a lab control sample and a lab control sample duplicate for each digestion batch and was within specified control limits. A replicate analysis was performed on a frequency of 1 in 20 samples per digestion batch.

REASONS FOR REANALYSIS:
Lithium is added to the samples to enhance the recovery for potassium and sodium so therefore lithium had to be analyzed on a separate run.

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In the soil analysis Zn, Al, Ca, Mn, Fe, and Sr were reanalyzed due to QC failures in the original run. Zn was reanalyzed a third time due to QC failure in the second ICP run
In the water analysis Zn was reanalyzed due to the analyst having concern over the calibration of zinc during the initial analysis. The second calibration read better and this is the run that was reported for zinc.

EXPLANATIONS OF ANY DEVIATIONS FROM ROUTINE PROTOCOLS:
There were no deviations from routine protocol.

EXPLANATIONS FOR ITEMS MARKED 'N' ON DATA REVIEW CHECKLIST:
For the water analysis: The ICP CRDL standard was outside the 80-120% recovery limits for Mo and Sn; no out of control action is required.
For the soil analysis: No were marked 'N'

Sincerely,

Deborah J. Inman
Inorganic Program Manager

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 99A8058#002

Collector PG/HS	Contact/Requester GARCIA ERNIE	Telephone No (303) 966 5980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code EC430500
Project Title 750 PAD/B984	Logbook No	Ice Chest No Temp 4°C
To (Lab) SouthWest Lab of Oklahoma	Method of Shipment FEDEX	Bill of Lading/Air Bill No 807912276954
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes ☐ No ☐
TWO EXTRA BOTTLES HAVE BEEN SENT FOR EACH AQUEOUS VOA EVENT

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-001 002	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-001 003	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-002 001	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-002 002	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-003 001	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-003 002	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-004 001	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125 G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[signature]	6-16-99 1800						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer per lab procedure, used in process) Disposed By Date/Time

Received By: SWLO 6/17/99 1000

64 GE-97

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-004 002	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-005 001	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-005 002	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-006 001	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-006 002	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-007 001	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-007 002	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-008 001	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-008 002	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-009 001	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-009 002	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph Nuckell	6-16-99 1800						

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer per lab procedure used in process) — Disposed By — Date/Time

65 B2-48

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 99A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-010 001	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-010 002	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-011 001	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-011 002	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-012 001	Boring 9906 S-12	SOLID	6/11/99	1344	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-012 002	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-013 001	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G G	SS01B006 (VOA 8260-Soil) [Priority]	None 4 degrees C
99A8058-013 002	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	125-G P/G	SS05B048 (Mtls SW846) [Priority]	None 4 degrees C
99A8058-014 002	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] ~~Spare~~	None 4 degs C w/zh
99A8058-014 003	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zh
99A8058-014 004	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	40-ML G	SS01B009 (VOA 524 2 Water) [Priority] Spare	None 4 degs C w/zh

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[illegible]	6-16-99 8:00						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) Disposed By Date/Time

66 B2-49

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # A8058#002

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303) 966 5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative Packing
99A8058-014 005	Rinsate	AQUEOUS	4/11/99	1430	750 PAD	1-L P/G	SS05B022 (Mtls Unfiltered SW846) [Priority]	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ralph Muchsel	6-16-99 1800						

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) Disposed By Date/Time

67 B2-50

3
BLANKS

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code SWOK__ Case No . 39048 SAS No _____ SDG No 39048A

Preparation Blank Matrix (soil/water) SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg) MG/KG

Analyte	Initial Calib Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	28.0	U	28.0	U	28.0	U	28 0	U	2 80	U	P
Antimony	4.7	B	2.9	B	2 8	B	3 4	B	0 48	B	P
Arsenic	1.9	U	1.9	U	1 9	U	1.9	U	0.19	U	P
Barium	1.2	U	1 2	U	1.2	U	9 8	B	0 12	U	P
Beryllium	0.8	U	0 8	U	0 8	U	0 8	U	0 08	U	P
Cadmium	0 3	U	0.3	U	0 3	B	0 3	U	0.03	U	P
Calcium	258 0	U	258.0	U	258.0	U	258 0	U	25 80	U	P
Chromium	1.4	U	1 4	U	1.4	U	1.8	B	0.14	U	P
Cobalt	0.8	U	0.8	U	0 8	U	0.8	B	0.08	U	P
Copper	2.5	U	2.5	U	2.5	U	2.5	U	0.44	B	P
on	33.0	U	33.0	U	33.0	U	33.0	U	3 30	U	P
Lead	2.2	U	2.2	U	2.2	U	2.2	U	0.22	U	P
Magnesium	92.0	U	92.0	U	92.0	U	1095.3	B	9.20	U	P
Manganese	0.6	U	0.6	U	0 6	U	0.6	U	0.06	U	P
Nickel	3.6	U	3 6	U	3 6	U	3.6	U	0.36	U	P
Potassium	152.0	U	152 0	U	152 0	U	152.0	U	15.20	U	P
Selenium	3.3	U	3.3	U	3.3	U	3.3	U	0 33	U	P
Silver	1.2	U	1.7	B	1 2	U	1.5	B	0 15	B	P
Sodium	502.0	U	502.0	U	502.0	U	502 0	U	50 20	U	P
Thallium	3.4	U	3.4	U	3 4	U	3 4	U	0 34	U	P
Vanadium	0.7	U	0.7	U	0 7	U	1.5	B	0 07	U	P
Zinc	3.8	U	3.8	U	3 8	U	3 8	U	0 83	B	P
Molybdenu	1.7	U	1 7	U	1 7	U	2 2	B	0 17	U	P
Tin	4 1	U	4 1	U	4 1	U	4 1	U	1 22	B	P
Strontium	0.6	U	0.6	U	0.6	U	0 6	U	0 06	U	P
Lithium	7.2	U	7.2	U	7 2	U	7.2	U	4 59	B	P
Uranium	9.6	U	19.7	B	13 8	B	16 7	B	1.31	B	P

FORM III - IN

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3
BLANKS

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code SWOK__ Case No 39048 SAS No _____ SDG No . 39048A

Preparation Blank Matrix (soil/water) _____

Preparation Blank Concentration Units (ug/L or mg/kg) _____

Analyte	Initial Calib Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			28 0	U							P
Antimony			3 3	B							P
Arsenic			1.9	U							P
Barium			1 2	U							P
Beryllium			0 8	U							P
Cadmium			0 3	U							P
alcium			258.0	U							P
hromium			1.4	U							P
Cobalt			0.8	U							P
Copper			2.5	U							P
on			33.0	U							P
Lead			2.2	U							P
Magnesium			92.0	U							P
Manganese			0.6	U							P
Nickel			3.6	U							P
Potassium			152 0	U							P
Selenium			3.3	U							P
Silver			1.2	U							P
Sodium			502 0	U							P
Thallium			3 4	U							P
Vanadium			0.7	U							P
Zinc			3.8	U							P
Molybdenu			1.7	U							P
Tin			4.1	U							P
Strontium			0.6	U							P
Lithium			7 2	U							P
Uranium			15 8	B							P

FORM III - IN

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7

LABORATORY CONTROL SAMPLE

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058

Lab Code SWOK Case No 39048 SAS No _____ SDG No 39048A

Solid LCS Source IN VEN _____

Aqueous LCS Source _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum				200.000	180 018		160 000	240 000	90.01
Antimony				50 000	42 943		40 000	60.000	85 89
Arsenic				8 000	7.518	B	6.400	9.600	93.97
Barium				25 000	23.674		20.000	30.000	94 70
Beryllium				5.000	4 594		4 000	6 000	91.88
Cadmium				5 000	4 317		4 000	6 000	86 34
Calcium				500.000	502.396	B	400 000	600.000	100.4
Chromium				20 000	18.546		16 000	24.000	92.73
Cobalt				50 000	44.982		40 000	60 000	89.96
Copper				25.000	21.347		20 000	30.000	85.39
Iron				100.000	92.098		80.000	120.000	92.10
Lead				8.000	7.458	B	6.400	9.600	93.22
agnesium				500.000	476.369	B	400.000	600.000	95.27
nganese				50.000	45.875		40.000	60.000	91.75
Nickel				50.000	45.520		40.000	60.000	91.04
Potassium				1000.000	897.718	B	800.000	1200.000	89.77
Selenium				8.000	7.570	B	6.400	9.600	94.62
Silver				5.000	5.405		4.000	6.000	108.1
Sodium				1000 000	995 726	B	800.000	1200.000	99.57
Thallium				8.000	7.499	B	6.400	9.600	93.74
Vanadium				50.000	44.824		40.000	60.000	89.65
Zinc				50.000	48.638		40 000	60.000	97.28
Molybdenu				20 000	18 839	B	16 000	24.000	94 19
Tin				25.000	25 364	B	20.000	30.000	101 4
Strontium				20 000	19.423	B	16 000	24.000	97.11
Lithium				100 000	114.510		80 000	120.000	114.5
Uranium				50 000	45.420		40 000	60.000	90 84

FORM VII - IN

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LABORATORY CONTROL SAMPLE

Lab Name SOUTHWEST_LAB_OF_OK_____ Contract 99A8058___

Lab Code SWOK__ Case No 39048 SAS No _____ SDG No 39048A_

Solid LCS Source IN VEN _____

Aqueous LCS Source _____

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	Aqueous (ug/L) %R	Solid (mg/kg) True	Solid (mg/kg) Found	Solid (mg/kg) C	Solid (mg/kg) Limits		Solid (mg/kg) %R
Aluminum				200 000	179 962		160 000	240 000	89 98
Antimony				50.000	43.623		40 000	60 000	87 25
Arsenic				8.000	7 446	B	6.400	9.600	93 07
Barium				25 000	23.357		20 000	30.000	93 43
Beryllium				5 000	4.522		4 000	6 000	90 44
Cadmium				5 000	4.228		4 000	6 000	84 56
Calcium				500 000	503 766	B	400 000	600 000	100 7
Chromium				20 000	18.275		16.000	24 000	91.37
Cobalt				50 000	44.062		40 000	60 000	88.12
Copper				25.000	21.100		20 000	30.000	84.40
Iron				100.000	93.098		80.000	120.000	93.10
Lead				8.000	7.365	B	6.400	9.600	92.06
agnesium				500.000	467.367	B	400.000	600.000	93.47
nganese				50.000	45.942		40.000	60.000	91.88
ickel				50.000	44.759		40.000	60.000	89.52
Potassium				1000 000	874.637	B	800.000	1200.000	87 46
Selenium				8.000	7.443	B	6.400	9.600	93.04
Silver				5.000	5.263		4.000	6.000	105.2
Sodium				1000 000	997.070	B	800 000	1200.000	99 71
Thallium				8 000	7.579	B	6.400	9.600	94.74
Vanadium				50 000	44.020		40.000	60.000	88.04
Zinc				50 000	48.588		40.000	60.000	97 18
Molybdenu				20 000	18.708	B	16.000	24.000	93.54
Tin				25 000	24 901	B	20.000	30.000	99 60
Strontium				20.000	19 414	B	16.000	24 000	97 07
Lithium				100.000	113 489		80.000	120.000	113 4
Uranium				50.000	44.878		40.000	60.000	89 76

FORM VII - IN

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9901 S-1

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-001003

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058

Lab Code SWOK Case No 39048 SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 14

Level (low/med) LOW Date Received 06/17/99

% Solids 94 1

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9100			P
7440-36-0	Antimony	0 29	U	N	P
7440-38-2	Arsenic	4 4	B		P
7440-39-3	Barium	79 6			P
7440-41-7	Beryllium	0 64	B		P
7440-43-9	Cadmium	0 08	B		P
7440-70-2	Calcium	5990	B	N	P
7440-47-3	Chromium	10 7			P
7440-48-4	Cobalt	4 2	B		P
7440-50-8	Copper	12 0			P
7439-89-6	Iron	11000			P
7439-92-1	Lead	8.5	B		P
7439-95-4	Magnesium	1990	B		P
7439-96-5	Manganese	157			P
7440-02-0	Nickel	9.5			P
7440-09-7	Potassium	1470	B	E	P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium	281	B		P
7440-28-0	Thallium	0 44	B		P
7440-62-2	Vanadium	23.5			P
7440-66-6	Zinc	28.0			P
7439-98-7	Molybdenu	0.54	B		P
7440-31-5	Tin	3 0	B		P
7440-24-6	Strontium	17.9	B		P
7439-93-2	Lithium	36 2			P
7440-61-1	Uranium	1 8	B		P

Color Before BROWN Clarity Before Texture MEDIUM

Color After COLORLESS Clarity After CLEAR Artifacts

Comments

CLIENT_ID= 99A8058-001 003

FORM I - IN

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9901 S-1

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-001003

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 14
Level (low/med) LOW Date Received 06/17/99
% Solids 94 1

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9100			P
7440-36-0	Antimony	0 29	U	N	P
7440-38-2	Arsenic	4 4	B		P
7440-39-3	Barium	79 6			P
7440-41-7	Beryllium	0 64	B		P
7440-43-9	Cadmium	0 08	B		P
7440-70-2	Calcium	5990	B	N	P
7440-47-3	Chromium	10 7			P
7440-48-4	Cobalt	4 2	B		P
7440-50-8	Copper	12 0			P
7439-89-6	Iron	11000			P
7439-92-1	Lead	8 5	B		P
7439-95-4	Magnesium	1990	B		P
7439-96-5	Manganese	157			P
7440-02-0	Nickel	9.5			P
7440-09-7	Potassium	1470	B	E	P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium	281	B		P
7440-28-0	Thallium	0 44	B		P
7440-62-2	Vanadium	23.5			P
7440-66-6	Zinc	28.0			P
7439-98-7	Molybdenu	0 54	B		P
7440-31-5	Tin	3.0	B		P
7440-24-6	Strontium	17 9	B		P
7439-93-2	Lithium	36.2			P
7440-61-1	Uranium	1.8	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-001 003

FORM I - IN

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B7-56

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9901, S-2

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-002002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 15
Level (low/med) LOW Date Received 06/17/99
% Solids 92 6

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2420			P
7440-36-0	Antimony	0 29	U	N	P
7440-38-2	Arsenic	1.4	B		P
7440-39-3	Barium	19 4	B		P
7440-41-7	Beryllium	0.17	B		P
7440-43-9	Cadmium	0 03	U		P
7440-70-2	Calcium	934	B	N	P
7440-47-3	Chromium	6 5			P
7440-48-4	Cobalt	1 6	B		P
7440-50-8	Copper	5 2	B		P
7439-89-6	Iron	6710			P
7439-92-1	Lead	3.7	B		P
7439-95-4	Magnesium	831	B		P
7439-96-5	Manganese	51.4			P
7440-02-0	Nickel	3.4	B		P
7440-09-7	Potassium	653	B	E	P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	0 13	U		P
7440-23-5	Sodium	246	B		P
7440-28-0	Thallium	0.36	U		P
7440-62-2	Vanadium	10 7			P
7440-66-6	Zinc	13.1			P
7439-98-7	Molybdenu	0.62	B		P
7440-31-5	Tin	2 1	B		P
7440-24-6	Strontium	6 0	B		P
7439-93-2	Lithium	28 3			P
7440-61-1	Uranium	1.5	B		P

Color Before BROWN Clarity Before: Texture. MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-002 002

FORM I - IN

B2-57

74

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9901, s-2

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-002002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 15
Level (low/med) LOW Date Received 06/17/99
% Solids 92 6

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2420			P
7440-36-0	Antimony	0 29	U	N	P
7440-38-2	Arsenic	1 4	B		P
7440-39-3	Barium	19 4	B		P
7440-41-7	Beryllium	0 17	B		P
7440-43-9	Cadmium	0.03	U		P
7440-70-2	Calcium	934	B	N	P
7440-47-3	Chromium	6 5			P
7440-48-4	Cobalt	1 6	B		P
7440-50-8	Copper	5 2	B		P
7439-89-6	Iron	6710			P
7439-92-1	Lead	3.7	B		P
7439-95-4	Magnesium	831	B		P
7439-96-5	Manganese	51.4			P
7440-02-0	Nickel	3 4	B		P
7440-09-7	Potassium	653	B	E	P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	0 13	U		P
7440-23-5	Sodium	246	B		P
7440-28-0	Thallium	0 36	U		P
7440-62-2	Vanadium	10 7			P
7440-66-6	Zinc	13.1			P
7439-98-7	Molybdenu	0.62	B		P
7440-31-5	Tin	2 1	B		P
7440-24-6	Strontium	6.0	B		P
7439-93-2	Lithium	28 3			P
7440-61-1	Uranium	1.5	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-002 002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-003002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 16
Level (low/med) LOW Date Received 06/17/99
% Solids 96 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6990			P
7440-36-0	Antimony	0 28	U	N	P
7440-38-2	Arsenic	1 7	B		P
7440-39-3	Barium	67 7			P
7440-41-7	Beryllium	0 29	B		P
7440-43-9	Cadmium	0 08	B		P
7440-70-2	Calcium	2580	B	N	P
7440-47-3	Chromium	14 6			P
7440-48-4	Cobalt	4 2	B		P
7440-50-8	Copper	14 6			P
7439-89-6	Iron	13000			P
7439-92-1	Lead	7.5	B		P
7439-95-4	Magnesium	2950	B		P
7439-96-5	Manganese	176			P
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	2360	B	E	P
7782-49-2	Selenium	0.34	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium	300	B		P
7440-28-0	Thallium	0.52	B		P
7440-62-2	Vanadium	23.7			P
7440-66-6	Zinc	29 1			P
7439-98-7	Molybdenu	1 0	B		P
7440-31-5	Tin	3.2	B		P
7440-24-6	Strontium	10.2	B		P
7439-93-2	Lithium	27 6			P
7440-61-1	Uranium	1.6	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments:
CLIENT_ID= 99A8058-003 002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-003002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water). SOIL Lab Sample ID 39048 16
Level (low/med) LOW Date Received 06/17/99
% Solids 96 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6990			P
7440-36-0	Antimony	0 28	U	N	P
7440-38-2	Arsenic	1 7	B		P
7440-39-3	Barium	67 7			P
7440-41-7	Beryllium	0.29	B		P
7440-43-9	Cadmium	0 08	B		P
7440-70-2	Calcium	2580	B	N	P
7440-47-3	Chromium	14 6			P
7440-48-4	Cobalt	4 2	B		P
7440-50-8	Copper	14 6			P
7439-89-6	Iron	13000			P
7439-92-1	Lead	7 5	B		P
7439-95-4	Magnesium	2950	B		P
7439-96-5	Manganese	176			P
7440-02-0	Nickel	8 4			P
7440-09-7	Potassium	2360	B	E	P
7782-49-2	Selenium	0.34	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium	300	B		P
7440-28-0	Thallium	0.52	B		P
7440-62-2	Vanadium	23 7			P
7440-66-6	Zinc	29 1			P
7439-98-7	Molybdenu	1 0	B		P
7440-31-5	Tin	3 2	B		P
7440-24-6	Strontium	10 2	B		P
7439-93-2	Lithium	27.6			P
7440-61-1	Uranium	1.6	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-003 002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-004002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058

Lab Code SWOK Case No 39048 SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 17

Level (low/med) LOW Date Received 06/17/99

% Solids 87 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7930			P
7440-36-0	Antimony	0 31	U	N	P
7440-38-2	Arsenic	3 9	B		P
7440-39-3	Barium	79.0			P
7440-41-7	Beryllium	0.99	B		P
7440-43-9	Cadmium	0.05	B		P
7440-70-2	Calcium	5370	B	N	P
7440-47-3	Chromium	11 5			P
7440-48-4	Cobalt	6 0	B		P
7440-50-8	Copper	12.8			P
7439-89-6	Iron	10300			P
7439-92-1	Lead	12.3			P
7439-95-4	Magnesium	1820	B		P
7439-96-5	Manganese	118			P
7440-02-0	Nickel	9.8			P
7440-09-7	Potassium	796	B	E	P
7782-49-2	Selenium	0.38	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	283	B		P
7440-28-0	Thallium	0.43	B		P
7440-62-2	Vanadium	14.6			P
7440-66-6	Zinc	31.1			P
7439-98-7	Molybdenu	0 92	B		P
7440-31-5	Tin	2.5	B		P
7440-24-6	Strontium	33 5	B		P
7439-93-2	Lithium	25 8			P
7440-61-1	Uranium	1.1	U		P

Color Before BROWN Clarity Before Texture MEDIUM

Color After COLORLESS Clarity After CLEAR Artifacts

Comments

CLIENT_ID= 99A8058-004.002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-004002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 17
Level (low/med) LOW Date Received 06/17/99
% Solids 87 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7930			P
7440-36-0	Antimony	0 31	U	N	P
7440-38-2	Arsenic	3 9	B		P
7440-39-3	Barium	79 0			P
7440-41-7	Beryllium	0.99	B		P
7440-43-9	Cadmium	0.05	B		P
7440-70-2	Calcium	5370	B	N	P
7440-47-3	Chromium	11 5			P
7440-48-4	Cobalt	6 0	B		P
7440-50-8	Copper	12 8			P
7439-89-6	Iron	10300			P
7439-92-1	Lead	12.3			P
7439-95-4	Magnesium	1820	B		P
7439-96-5	Manganese	118			P
7440-02-0	Nickel	9.8			P
7440-09-7	Potassium	796	B	E	P
7782-49-2	Selenium	0.38	U		P
7440-22-4	Silver	0 14	U		P
7440-23-5	Sodium	283	B		P
7440-28-0	Thallium	0.43	B		P
7440-62-2	Vanadium	14.6			P
7440-66-6	Zinc	31.1			P
7439-98-7	Molybdenu	0 92	B		P
7440-31-5	Tin	2.5	B		P
7440-24-6	Strontium	33 5	B		P
7439-93-2	Lithium	25 8			P
7440-61-1	Uranium	1 1	U		P

Color Before BROWN Clarity Before. Texture MEDIUM
Color After COLORLESS Clarity After. CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-004 002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-005002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058

Lab Code SWOK Case No 39048 SAS No SDG No 39048A

Matrix (soil/water) SOIL Lab Sample ID 39048 18

Level (low/med) LOW Date Received 06/17/99

% Solids 88.1

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8770			P
7440-36-0	Antimony	0 29	U	N	P
7440-38-2	Arsenic	2 0	B		P
7440-39-3	Barium	51 0			P
7440-41-7	Beryllium	0.37	B		P
7440-43-9	Cadmium	0.10	B		P
7440-70-2	Calcium	5100	B	N	P
7440-47-3	Chromium	8.6			P
7440-48-4	Cobalt	6 4	B		P
7440-50-8	Copper	8 1			P
7439-89-6	Iron	16600			P
7439-92-1	Lead	7.6	B		P
7439-95-4	Magnesium	4840	B		P
7439-96-5	Manganese	328			P
7440-02-0	Nickel	7.3	B		P
7440-09-7	Potassium	1650	B	E	P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium	299	B		P
7440-28-0	Thallium	0.37	U		P
7440-62-2	Vanadium	21.0			P
7440-66-6	Zinc	59.3			P
7439-98-7	Molybdenu	0.59	B		P
7440-31-5	Tin	2 9	B		P
7440-24-6	Strontium	10.3	B		P
7439-93-2	Lithium	38.1			P
7440-61-1	Uranium	1.5	B		P

Color Before BROWN Clarity Before. Texture MEDIUM

Color After COLORLESS Clarity After CLEAR Artifacts

Comments

CLIENT_ID= 99A8058-005 002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-005002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 18
Level (low/med) LOW Date Received 06/17/99
% Solids 88 1

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8770			P
7440-36-0	Antimony	0 29	U	N	P
7440-38-2	Arsenic	2 0	B		P
7440-39-3	Barium	51 0			P
7440-41-7	Beryllium	0.37	B		P
7440-43-9	Cadmium	0 10	B		P
7440-70-2	Calcium	5100	B	N	P
7440-47-3	Chromium	8 6			P
7440-48-4	Cobalt	6 4	B		P
7440-50-8	Copper	8 1			P
7439-89-6	Iron	16600			P
7439-92-1	Lead	7 6	B		P
7439-95-4	Magnesium	4840	B		P
7439-96-5	Manganese	328			P
7440-02-0	Nickel	7 3	B		P
7440-09-7	Potassium	1650	B	E	P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0 13	U		P
7440-23-5	Sodium	299	B		P
7440-28-0	Thallium	0.37	U		P
7440-62-2	Vanadium	21 0			P
7440-66-6	Zinc	59.3			P
7439-98-7	Molybdenu	0 59	B		P
7440-31-5	Tin	2 9	B		P
7440-24-6	Strontium	10 3	B		P
7439-93-2	Lithium	38.1			P
7440-61-1	Uranium	1.5	B		P

Color Before BROWN Clarity Before. Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-005 002

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

8058-006002

Lab Name SOUTHWEST_LAB_OF_OK Contract 99A8058
Lab Code SWOK Case No 39048 SAS No SDG No 39048A
Matrix (soil/water) SOIL Lab Sample ID 39048 19
Level (low/med) LOW Date Received 06/17/99
% Solids 85 5

Concentration Units (ug/L or mg/kg dry weight) MG/KG

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14100			P
7440-36-0	Antimony	0 32	U	N	P
7440-38-2	Arsenic	6 7	B		P
7440-39-3	Barium	96 8			P
7440-41-7	Beryllium	0.93	B		P
7440-43-9	Cadmium	0.10	B		P
7440-70-2	Calcium	9920	B	N	P
7440-47-3	Chromium	15.2			P
7440-48-4	Cobalt	5 4	B		P
7440-50-8	Copper	12.1			P
7439-89-6	Iron	14800			P
7439-92-1	Lead	9.1	B		P
7439-95-4	Magnesium	2560	B		P
7439-96-5	Manganese	153			P
7440-02-0	Nickel	13.6			P
7440-09-7	Potassium	1780	B	E	P
7782-49-2	Selenium	0.39	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	278	B		P
7440-28-0	Thallium	0 44	B		P
7440-62-2	Vanadium	31.8			P
7440-66-6	Zinc	33.3			P
7439-98-7	Molybdenu	0 47	B		P
7440-31-5	Tin	2 3	B		P
7440-24-6	Strontium	27 8	B		P
7439-93-2	Lithium	36.7			P
7440-61-1	Uranium	2.3	B		P

Color Before BROWN Clarity Before Texture MEDIUM
Color After COLORLESS Clarity After CLEAR Artifacts

Comments
CLIENT_ID= 99A8058-006 002

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APPENDIX B-3

LABORATORY RESULTS – RADIOISOTOPES

Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 98058#003

Collector PG/HS	Contact/Requester GARCIA, ERNIE	Telephone No (303)966-5980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code EC130500
Project Title 750 PAD / B984	Logbook No	Ice Chest No Temp
To (Lab) S Cohen & Associates	Method of Shipment Fed EX	Bill of Lading/Air Bill No 807912276932
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes [ ] No [ ]

Bottle ID	Customer Number	Matrix	Date	Time	Location	Bottle Type/Container	Sample Analysis	Preservative Packing
99A8058-001 004	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-002 004	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-003 004	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-004 004	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-005 004	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-006 004	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-007 004	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Ray Mucker	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer, special procedure, incinerator) Disposed By Date/Time

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Tierra

CHAIN OF CUSTODY SAMPLE ANALYSIS REQUEST

COC # A8058#003

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No (303)966-5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	Number Type Container	Sample Analysis	Preservative Lacking
99A8058-008 004	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-009 004	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-010 004	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-011 004	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-012 004	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-013 004	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority]	None 4 degrees C
99A8058-014 006	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	1 L P	RC01B007 (Americium - Water) [Priority], RC01B012 (Plutonium (Water)) [Priority]	HN03 4 degrees C
99A8058-014 007	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	1 L P	RC01B017 (Uranium (Water)) [Priority]	HN03 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
[signature]	6-16-99 1800						
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure used in process) Disposed By Date/Time

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COVER PAGE

Sanford Cohen & Associates
Southeastern Environmental Laboratory
1000 Monticello Court
Montgomery, Alabama 36117

Laboratory Code: SCA Subcontract Number: KH700325EP6

RIN: 99A8058
LIC. RC01B003
LIC RC01B007
LIC RC01B017
Laboratory Report Identification Code: 1604, 1605, 1606

Sample Matrix: Soil

Site Sample Numbers	Laboratory Sample Number		
	Uranium	Plutonium	Americium
99A8058-001 004 Boring 9901, S-1 750 Pad	KH199-1604-01	KH199-1604-01	KH199-1604-01
99A8058-002.004 Boring 9901, S-2 750 Pad	KH199-1604-02	KH199-1604-02	KH199-1604-02
99A8058-003.004 Boring 9901, S-3 750 Pad	KH199-1604-03	KH199-1604-03	KH199-1604-03
99A8058-004.004 Boring 9901, S-4 750 Pad	KH199-1604-04	KH199-1604-04	KH199-1604-04
99A8058-005.004 Boring 9901, S-5 750 Pad	KH199-1604-05	KH199-1604-05	KH199-1604-05
99A8058-006.004 Boring 9901, S-6 750 Pad	KH199-1604-06	KH199-1604-06	KH199-1604-06
99A8058-007.004 Boring 9901, S-7 750 Pad	KH199-1604-07	KH199-1604-07	KH199-1604-07
99A8058-008 004 Boring 9901, S-8 750 Pad	KH199-1604-08	KH199-1604-08	KH199-1604-08
99A8058-009.004 Boring 9901, S-9 750 Pad	KH199-1604-09	KH199-1604-09	KH199-1604-09
99A8058-010.004 Boring 9901, S-10 750 Pad	KH199-1604-010	KH199-1604-010	KH199-1604-10
Laboratory Control Sample (LC)	SCAQC-1604-LC1	SCAQC-1604-LC1	SCAQC-1604-LC1
Duplicate (LD)	SCAQC-1604-LD1	SCAQC-1604-LD1	SCAQC-1604-LD1
Preparation Blank (PB)	SCAQC-1604-PB	SCAQC-1604-PB	SCAQC-1604-PB

Site Sample Numbers	Laboratory Sample Number		
	Uranium	Plutonium	Americium
99A8058-011.004 Boring 9901, S-11 750 Pad	KH199-1605-01	KH199-1605-01	KH199-1605-01
99A8058-012 004 Boring 9901, S-12 750 Pad	KH199-1605-02	KH199-1605-02	KH199-1605-02
99A8058-013 004 Boring 9901, S-13 750 Pad	KH199-1605-03	KH199-1605-03	KH199-1605-03
Laboratory Control Sample (LC)	SCAQC-1604-LC1	SCAQC-1604-LC1	SCAQC-1604-LC1
Duplicate (LD)	SCAQC-1604-LD1	SCAQC-1604-LD1	SCAQC-1604-LD1
Preparation Blank (PB)	SCAQC-1604-PB	SCAQC-1604-PB	SCAQC-1604-PB

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COVER PAGE (Continued)

Sanford Cohen & Associates
Southeastern Environmental Laboratory
1000 Monticello Court
Montgomery, Alabama 36117

Laboratory Code: SCA Subcontract Number: KH700325EP6

RIN: 99A8058
LIC: RC01B003
LIC. RC01B007
LIC RC01B017
Laboratory Report Identification Code: 1604, 1605, 1606

Sample Matrix: Water

Site Sample Numbers	Laboratory Sample Number		
	Uranium	Plutonium	Americium
99A8058-014.006 Rinsate 750 Pad	KH199-1606-01	KH199-1606-01	KH199-1606-01
99A8058-014.007 Rinsate 750 Pad	KH199-1606-02	KH199-1606-02	KH199-1606-02
Laboratory Control Sample (LC)	SCAQC-1599-LC1	SCAQC-1599-LC1	SCAQC-1599-LC1
Duplicate (LD)	SCAQC-1599-LD1	SCAQC-1599-LD1	SCAQC-1599-LD1
Preparation Blank (PB)	SCAQC-1599-PB	SCAQC-1599-PB	SCAQC-1599-PB

Comments. There were no problems encountered during sample receiving

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the laboratory Manager or the Manager's designee, as verified by the following signature."

Signature

Joe Stunson
Name

Laboratory Manager
Title

7/8/99
Date

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Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 8058#003

Collector PG/HS	Contact/Requester GARCIA, ERNIE	Telephone No (303)966-1980 MSIN FAX
RIN 99A8058	Sampling Origin	Purchase Order/Charge Code EC430500
Project Title 750 PAD / B984	Logbook No	Ice Chest No Temp
To (Lab) S Cohen & Associates	Method of Shipment Fed EX	Bill of Lading/Air Bill No. 8079122676932
Protocol		Offsite Property No

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption Yes ☐ No ☐

KH199 - 1604 -

Batch No	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative, Packing
99A8058 001 004	Boring 9901, S-1	SOLID	6/11/99	0905	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] -01	None 4 degrees C
99A8058-002 004	Boring 9901, S-2	SOLID	6/11/99	0926	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 02	None 4 degrees C
99A8058 003 004	Boring 9902, S-3	SOLID	6/11/99	0956	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 03	None 4 degrees C
99A8058-004 004	Boring 9902, S-4	SOLID	6/11/99	1011	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 04	None 4 degrees C
99A8058-005 004	Boring 9903, S-5	SOLID	6/11/99	1025	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 05	None 4 degrees C
99A8058-006 004	Boring 9903, S-6	SOLID	6/11/99	1042	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 06	None 4 degrees C
99A8058-007 004	Boring 9904, S-7	SOLID	6/11/99	1210	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 07	None 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Reyn Mucland	6-12-99 1800	B Fisher/SCA	6-18-99 0830				
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure used in process) Disposed By Date/Time

The time on the sample label for -007-004 reads 1155 rather than 1210.

07 09 99 11 44 S COHEN & ASSOC 005

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Tierra

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COC # 9[illegible]8058#003

RIN 99A8058

Contact/Requestor GARCIA, ERNIE

Telephone No. (303)966 5980 MSIN FAX

Bottle No	Customer Number	Matrix	Date	Time	Location	Net Type Container	Sample Analysis KH199-1604 -	Preservative Packing
99A8058-008 004	Boring 9904, S-8	SOLID	6/11/99	1215	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 08	None 4 degrees C
99A8058-009 004	Boring 9904, S-9	SOLID	6/11/99	1220	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 09	None 4 degrees C
99A8058-010 004	Boring 9905, S-10	SOLID	6/11/99	1317	750 PAD	250-G P/G	RC01B003 (Isotopic (Soil)) [Priority] 10	None 4 degrees C
99A8058-011 004	Boring 9905, S-11	SOLID	6/11/99	1326	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] KH199-1605 - 01	None 4 degrees C
99A8058-012 004	Boring 9906, S-12	SOLID	6/11/99	1344	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 02	None 4 degrees C
99A8058-013 004	Boring 9906, S-13	SOLID	6/11/99	1357	750 PAD	250 G P/G	RC01B003 (Isotopic (Soil)) [Priority] 03	None 4 degrees C
99A8058-014 006	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	4 L P	RC01B007 (Americium - Water) [Priority], RC01B012 (Plutonium (Water)) [Priority] KH199-1606 - 01	HNO3 4 degrees C
99A8058-014 007	Rinsate	AQUEOUS	6/11/99	1430	750 PAD	1-L P	RC01B017 (Uranium (Water)) [Priority] 02	HNO3 4 degrees C

Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Roger Nicholson	6-16-99 1800	S Fisher/SCCA	0930 06-18-99				

FINAL SAMPLE DISPOSITION: Disposal Method (e.g. Return to customer per lab procedure, used in process) Disposed By Date/Time

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07 09/99 11 44 S COHEN & ASSOC 008

CASE NARRATIVE
RIN 99A8058
Laboratory Report Identification Number: 1604, 1605, 1606
PSA Module RC01B.3

July 8, 1999

I. Introduction

On June 18, 1999, 13 soil samples and two water samples, (RIN 99A8058), were received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama The chain-of-custody accompanying the sample requested they be analyzed on a "priority" basis. The samples were analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RC01-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently All samples were analyzed by Eichrom Industries, Inc extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical Results

Deficiencies

None.

Matrix Interferences

There were no indications of matrix interference

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses

Reanalysis

There were no reanalysis.

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Deviations from Protocols

There were no deviations from the written protocols and analytical methods.

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples.

IV. Quality Control

Site Samples Used for Quality Control Samples

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1604-LC1	Laboratory Control Sample
99A8058-001 004 Boring 9901, S-1 Pad 750	SCAQC-1604-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1604-PB	Preparation Blank

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1599-LC1	Laboratory Control Sample
99A7799-007 005 25.0 BH95998	SCAQC-1599-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1599-PB	Preparation Blank

The water sample received on 6/18/99, RIN 99A8058 (Batch No. 1606), was analyzed concurrently with one water sample received on 6/10/99, RIN 99A6825, (Batch No. 1599). Therefore, the Laboratory Control Sample (SCAQC-1599-LC1), the Laboratory Duplicate Sample (SCAQC-1599-LD1), and the Preparation Blank (SCAQC-1599-PB) were used as quality control samples for both sample batches.

The analytical results of all quality control samples met the acceptance criteria specified in the SOW

Sincerely,

Joe Stinson

Joe Stinson
Laboratory Manager

7/8/99
Date

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99S8058#003	Matrix	Soil
Site Sample ID	001.004				
Other Sample ID	BORING 9901 S-1	Collection Date:	6/11/99	Date Received	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-01	0.811	0.228	0.280	0.067
ACW03	U-235	KH199-1604-01	0.017	0.035	0.036	0.047
ACW03	U-238	KH199-1604-01	0.836	0.231	0.285	0.067
ACW03	PU-239/240	KH199-1604-01	0.087	0.078	0.080	0.075
ACW03	AM-241	KH199-1604-01	0.041	0.058	0.059	0.055

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix	Soil
Site Sample ID	002.004				
Other Sample ID	BORING 9901 S-2	Collection Date:	6/11/99	Date Received	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-02	0 754	0 213	0.261	0 064
ACW03	U-235	KH199-1604-02	0 099	0 081	0 088	0 045
ACW03	U-238	KH199-1604-02	0.539	0 177	0.207	0.064
ACW03	PU-239/240	KH199-1604-02	0 000	0.000	0 000	0 041
ACW03	AM-241	KH199-1604-02	0 095	0.078	0 080	0 043

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix:	Soil
Site Sample ID	003,004				
Other Sample ID	BORING 9902 S-3	Collection Date:	6/11/99	Date Received:	6/18/99
		Batch Number:	1604	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-03	0.608	0.214	0.268	0.034
ACW03	U-235	KH199-1604-03	0.040	0.055	0.057	0.075
ACW03	U-238	KH199-1604-03	0.422	0.152	0.173	0.080
ACW03	PU-239/240	KH199-1604-03	0.076	0.074	0.075	0.082
ACW03	AM-241	KH199-1604-03	0.046	0.063	0.063	0.084

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Report Identification Number '99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix	Soil
Site Sample ID	004.004				
Other Sample ID	BORING 9902 S-4	Collection Date:	6/11/99	Date Received.	6/13/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-04	0 596	0 182	0 218	0 060
ACW03	U-235	KH199-1604-04	0 050	0 065	0 066	0 088
ACW03	U-238	KH199-1604-04	0 801	0 212	0.268	0'034
ACW03	PU-239/240	KH199-1604-04	0 069	0 069	0 070	0 072
ACW03	AM-241	KH199-1604-04	0 000	0 000	0 000	0 046

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Report Identification Number 99A8058

Project Name.	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix.	Soil
Site Sample ID	005.004				
Other Sample ID	BORING 9903 S-5	Collection Date.	6/11/99	Date Received.	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-05	0 812	0 228	0.280	0 039
ACW03	U-235	KH199-1604-05	0 053	0 061	0 063	0 048
ACW03	U-238	KH199-1604-05	0 692	0.212	0.253	0 090
ACW03	PU-239/240	KH199-1604-05	-0 027	0 055	0 055	0 152
ACW03	AM-241	KH199-1604-05	0 000	0 000	0 000	0 045

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Report Identification Number: 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix	Soil
Site Sample ID	006.004				
Other Sample ID	BORING 9903 S-6	Collection Date:	6/11/99	Date Received:	6/18/99
		Batch Number	1604	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1604-06	0 909	0.236	0.298	0 084
ACW03	U-235	KH199-1604-06	0 016	0 033	0 033	0 044
ACW03	U-238	KH199-1604-06	0 884	0.231	0.291	0 036
ACW03	PU-239/240	KH199-1604-06	0 051	0 070	0 071	0 094
ACW03	AM-241	KH199-1604-06	0 016	0 032	0 033	0 044

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Quality Control Sample
Duplicate (LD1)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix	Soil
Site Sample ID	001,004				
Other Sample ID	BORING 9901 S-1	Collection Date	5/11/99	Date Received	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	SCAQC-1604-LD1	0.900	0.242	0.302	0.039
ACW03	U-235	SCAQC-1604-LD1	0.035	0.060	0.051	0.048
ACW03	U-238	SCAQC-1604-LD1	0.794	0.228	0.278	0.090
ACW03	PU-239/240	SCAQC-1604-LD1	0.016	0.041	0.042	0.077
ACW03	AM-241	SCAQC-1604-LD1	0.036	0.051	0.051	0.048

Laboratory Samples for Duplicates

Radionuclide	Laboratory Sample ID	Duplicate of Sample ID
U-233/234	SCAQC-1604-LD1	KH199-1604-01
U-235	SCAQC-1604-LD1	KH199-1604-01
U-238	SCAQC-1604-LD1	KH199-1604-01
PU-239/240	SCAQC-1604-LD1	KH199-1604-01
AM-241	SCAQC-1604-LD1	KH199-1604-01

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix	Water
Site Sample ID	014.006				
Other Sample ID	RINSATE 750 PAD	Collection Date	5/11/99	Date Received	6/18/99
		Batch Number	1606	Laboratory Code.	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	PU-239/240	KH199-1606-0*	-0 002	0 004	0 004	0 025
ACW03	AM-241	KH199-1606-01	0 005	0 010	0 010	0 014

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

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Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058[illegible]03	Matrix	Water
Site Sample ID	014.007				
Other Sample ID	RINSATE 750 PAD	Collection Date	6/11/99	Date Received:	6/18/99
		Batch Number	1606	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	KH199-1606-02	0.276	0 197	0 204	0 093
ACW03	U-236	KH199-1606-02	0 085	0 120	0 123	0 115
ACW03	U-238	KH199-1606-02	0.172	0 154	0 158	0 093

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

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Radioanalytical Results

Quality Control Sample
Preparation Blank (PB)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID	BLANK1				
Other Sample ID	BLANK1	Collection Date:	6/18/99	Date Received	6/18/99
				Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1604-PB	0.044	0 057	0 057	0 077
ACW03	U-235	SCAQC-1604-PB	0 017	0 034	0 034	0 045
ACW03	U-238	SCAQC-1604-PB	0 006	0 029	0 029	0 065
ACW03	PU-239/240	SCAQC-1604-PB	-0 007	0 013	0 014	0 080
ACW03	AM-241	SCAQC-1604-PB	0 034	0 048	0 049	0 046

	Quality Control Samples		
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Laboratory Control (LC1)

Report Identification Number 99A8056

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID.	CONTROL1				
Other Sample ID	CONTROL1	Collection Date.	6/18/99	Date Received	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1604-LC1	8.37	1 06	1 98	0 076
ACW03	U-238	SCAQC-1604-LC1	8 43	1 07	2 00	0 043
ACW03	PU-239/240	SCAQC-1604-LC1	5 60	0 941	1 46	0 044
ACW03	AM-241	SCAQC-1604-LC1	3.69	0 687	1 01	0 080

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Pu	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB
Am	SCAQC-1604-LC1	SCAQC-1604-LD1	SCAQC-1604-PB

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Radioanalytical Results

Quality Control Sample
Preparation Blank (PB)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID	BLANK2				
Other Sample ID	BLANK2	Collection Date	6/14/99	Date Received	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	SCAQC-1599-PB	0.024	0.024	0 025	0.025
ACW03	U-235	SCAQC-1599-PB	0 046	0.035	0 037	0 018
ACW03	U-238	SCAQC-1599-PB	0 029	0.026	0 027	0 025
ACW03	PU-239/240	SCAQC-1599-PB	0 000	0 000	0 000	0 020
ACW03	AM-241	SCAQC-1599-PB	0 000	0 000	0 000	0 017

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

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Radioanalytical Results

Quality Control Sample
Laboratory Control (LC1)

Report Identification Number 99A6058

Project Name	Kaiser-Hill	Chain-of-Custody Number	None	Matrix	Water
Site Sample ID	CONTROL2				
Other Sample ID	CONTROL2	Collection Date	6/14/99	Date Received:	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	SCAQC-1599-LC1	3.46	0 554	0 886	0 032
ACW03	U-238	SCAQC-1599-LC1	4.21	0 642	1 06	0 058
ACW03	PU-239/240	SCAQC-1599-LC1	2.55	0.496	0 712	0 027
ACW03	AM-241	SCAQC-1599-LC1	1 61	0 310	0.448	0 021

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

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Radioanalytical Results

Quality Control Sample
Duplicate (LD1)

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058/8003	Matrix	Water
Site Sample ID	99A7799-007.005				
Other Sample ID.	25.0 BH95998	Collection Date.	6/8/99	Date Received	6/18/99
				Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	SCAQC-1599-LD1	0.014	0 019	0 020	0 026
ACW03	U-235	SCAQC-1599-LD1	0 054	0 036	0 042	0 018
ACW03	U-238	SCAQC-1599-LD1	0 014	0 019	0 020	0 026
ACW03	PU-239/240	SCAQC-1599-LD1	0.011	0 015	0 016	0.015
ACW03	AM-241	SCAQC-1599-LD1	0.005	0.011	0 011	0 014

Laboratory Samples for Duplicates

Radionuclide	Laboratory Sample ID	Duplicate of Sample ID
U-233/234	SCAQC-1599-LD1	KH199-1599-01
U-235	SCAQC-1599-LD1	KH199-1599-01
U-238	SCAQC-1599-LD1	KH199-1599-01
PU-239/240	SCAQC-1599-LD1	KH199-1599-01
AM-241	SCAQC-1599-LD1	KH199-1599-01

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

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Radioanalytical Results

Report Identification Number 99A8058

Project Name	Kaiser-Hill	Chain-of-Custody Number	99A8058#003	Matrix:	Water
Site Sample ID	99A7799-007.005				
Other Sample ID	25.0 BH95998	Collection Date	8/8/99	Date Received:	8/18/99
		Batch Number	1599	Laboratory Code	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/L)	2 σ Counting Error (pCi/L)	Total Error (pCi/L)	MDA (pCi/L)
ACW03	U-233/234	KH199-1599-01	0 023	0 026	0 026	0 031
ACW03	U-235	KH199-1599-01	-0 003	0 005	0 006	0 033
ACW03	U-238	KH199-1599-01	0 033	0 027	0 028	0 016
ACW03	PU-239/240	KH199-1599-01	0 000	0 000	0 000	0 016
ACW03	AM-241	KH199-1599-01	0 005	0 011	0.011	0 015

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Pu	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB
Am	SCAQC-1599-LC1	SCAQC-1599-LD1	SCAQC-1599-PB

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Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number 99A8058

Project Name Kaiser-Hill Laboratory Code: SCA

Laboratory Control Sample (LC1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	(CV) Decay Corrected Activity of Spike Added (pCi/L)	(OV) Laboratory Control Sample Activity (pCi/L)	Laboratory Control Sample % Recovery (Accuracy)	Number of σ Between CV and OV
ACW03	AM-241	SCAQC-1599-LC1	1.91 ∓ 0.053	1.61 ∓ 0.448	84.5	1.05
ACW03	PU-239/240	SCAQC-1599-LC1	2.05 ∓ 0.045	2.55 ∓ 0.712	125	1.14
ACW03	U-233/234	SCAQC-1599-LC1	3.61 ∓ 0.145	3.46 ∓ 0.886	95.7	0.268
ACW03	U-238	SCAQC-1599-LC1	3.61 ∓ 0.145	4.21 ∓ 1.06	117	0.864
ACW03	AM-241	SCAQC-1604-LC1	4.24 ∓ 0.117	3.69 ∓ 1.01	87.0	0.870
ACW03	PU-239/240	SCAQC-1604-LC1	4.55 ∓ 0.100	5.60 ∓ 1.46	123	1.13
ACW03	U-233/234	SCAQC-1604-LC1	8.02 ∓ 0.321	8.37 ∓ 1.96	104	0.257
ACW03	U-238	SCAQC-1604-LC1	8.02 ∓ 0.321	8.43 ∓ 2.00	105	0.303

Laboratory Duplicate Sample (LD1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	Original Sample Activity (pCi/L)	Duplicate Sample Activity (pCi/L)	Difference Between Original Activity and Duplicate Sample Activity (F)	Ratio of the Difference Between the Sample Activities and the Propagated Measurement Original Activity and Uncertainty of the Difference at 2 σ (F/E)
ACW03	U-233/234	SCAQC-1599-LD1	0.023 ∓ 0.026	0.014 ∓ 0.020	0.009	0.278
ACW03	U-235	SCAQC-1599-LD1	-0.003 ∓ 0.006	0.054 ∓ 0.042	0.057	1.34
ACW03	U-238	SCAQC-1599-LD1	0.033 ∓ 0.028	0.014 ∓ 0.020	0.019	0.554
ACW03	PU-239/240	SCAQC-1599-LD1	0.000 ∓ 0.000	0.011 ∓ 0.016	0.011	0.696
ACW03	AM-241	SCAQC-1599-LD1	0.005 ∓ 0.011	0.005 ∓ 0.011	0.000	0.006
ACW03	U-233/234	SCAQC-1604-LD1	0.811 ∓ 0.280	0.900 ∓ 0.302	0.090	0.218
ACW03	U-235	SCAQC-1604-LD1	0.017 ∓ 0.035	0.035 ∓ 0.051	0.018	0.288
ACW03	U-238	SCAQC-1604-LD1	0.835 ∓ 0.285	0.794 ∓ 0.278	0.041	0.104
ACW03	PU-239/240	SCAQC-1604-LD1	0.087 ∓ 0.060	0.016 ∓ 0.042	0.071	0.787
ACW03	AM-241	SCAQC-1604-LD1	0.041 ∓ 0.059	0.036 ∓ 0.051	0.005	0.066

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Radioanalytical Results

Quality Control Tracer Yield

Report Identification Number 99A8058

Project Name: Kaiser-Hill Laboratory Code. SCA

Laboratory Sample ID	Am-243	Pu-242	U-232
KH199-1599-01	64 57	60 14	61 86
KH199-1604-01	64 97	78 79	91 26
KH199-1604-02	81 05	78 61	94 01
KH199-1604-03	76 05	85 14	69 9
KH199-1604-04	77 4	78.25	95.8
KH199-1604-05	81 47	58 88	83.4
KH199-1604-06	83 18	61.47	88 11
KH199-1604-07	92.75	82.87	84.49
KH199-1604-08	80 83	68.45	88 04
KH199-1604-09	50 38	69 49	87 04
KH199-1604-10	61 17	69 07	85.7
KH199-1605-01	67.27	74.65	87 13
KH199-1605-02	71 66	86 44	76 82
KH199-1605-03	58 75	73.95	79 54
KH199-1606-01	71 92	62.72	
KH199-1606-02			69.77
SCAQC-1599-LC1	85.24	68 05	50 84
SCAQC-1599-LD1	70 84	68 93	59 96
SCAQC-1599-PB	57.76	45 11	59.68
SCAQC-1604-LC1	88 49	81 61	80.49
SCAQC-1604-LD1	74 36	91 04	84 42
SCAQC-1604-PB	82.72	81.25	95 81

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