START 9713517.0913

B09DQ6-TMA-681

0046229

TMA

REDACTED COPY

FEB 1994
RECEIVED
SDLA

JAN 1997
RECEIVED
EDMC

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY & ORGANICS
Case No. 12-029
(TMA/ARLI W.O. No. A3-12-029)

METALS & NITRATE/NITRITE
Case No. N3-12-038
(TMA/Skinner & Sherman W.O. S3-12-147 & S3-12-148)

February 17, 1994

TMA Master Work Order N3-12-038

9713517.0914

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-038 000002

RCVD: 12/15/93 DUE: 01/19/94 12/15/93 11:23:02 KEEP: 01/19/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09DG6	ARLI	WH014	WH016	WH195	WH232
01C-S	B09DG6 MS	ARLI	WH014	WH016	WH195	WH232
01D-S	B09DG6 MSD	ARLI	WH014	WH016	WH195	
01E-S	B09DG6 DUP	ARLI	WH232			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
E Yamamoto	12-15-93	ARLI	12-15-93	[illegible]	12/16/93

9713517.0915

0000024

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-09-93

Ice Chest No.: SML-437 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-09-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
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1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Loren E. Rogers 0950	[signature]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.0916

000002B

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 12-09-93

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DQ6	S	12-09-93	0935	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			HER 12-09-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards RADIOACTIVE

A-6000-406 (06/91) WEF060

9713517.0917

(WHC) 000003

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARL

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D. WHITAKER

LOG-IN-DATE : 12-16-93

RECEIVED BY (SIGNATURE): D Whitaker

ICE CHEST NO. RADAR

	EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT,ETC
REMARKS:				
1. Custody Seal(s) Present / Absent* Intact / Broken		B09096	A312029	
2. Custody Seal Nos:				
3. Chain of Custody Records Present / Absent*				
4. Traffic Reports or Packing List Present / Absent*				
5. Airbill Airbill / Sticker Present / Absent*				
6. Airbill No.: 7289158030				
7. Sample Tags Present / Absent*				
8. Sample Tag Numbers Listed / Not Listed on Chain of Custody				
9. Sample Condition: Intact / Broken* / Leaking				
10. Does information on custody records, traffic reports, and sample tags agree? Yes / No*				
11. Date Recieved at Lab: 12-16-93				
12. Temp of ice chest 4 °C				
13. Time Recieved: 0900				
SAMPLE TRANSFER				
Fraction:				
Area #:				
By:				
On:				

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM DC-1

000004

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289158030

7289158030

RECIPIENT'S COPY

Date 12-15-93

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (818)-335-2033

Company:

Department/Floor No.:

Street Address:

City:

State:

ZIP Required:

2 To (Recipient's Name) Please Print: CAROLE HARRIS

Recipient's Phone Number (Very Important): (818)-357-3247

Company: TMA/AKH

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 TAYLOR STREET

City: MONROVIA

State: CA

ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here

Street Address:

City:

State:

ZIP Required:

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
- 11 [X] OTHER PACKAGING
- 16 [ ] FEDEX LETTER*
- 12 [ ] FEDEX PAK*
- 13 [ ] FEDEX BOX
- 14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
- 51 [ ] OTHER PACKAGING
- 56 [ ] FEDEX LETTER*
- 52 [ ] FEDEX PAK*
- 53 [ ] FEDEX BOX
- 54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
- 30 [ ] ECONOMY*

Government Overnight (Restricted for authorized users only)
- 46 [ ] GOVT LETTER
- 41 [ ] GOVT PACKAGE

* Economy Letter rate not available. Minimum charge: One pound economy rate.

Freight Service (for Packages over 150 lbs.)
- 70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
- 80 [ ] TWO-DAY FREIGHT**

† Delivery commitment may be later in some areas.

*Declared Value Limit $500. **Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 [ ] HOLD FOR PICK-UP (Fill in Box H)
- 2 [X] DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
- 4 DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required. Dry Ice, 9, UN 1845, ___ x ___ kg. 904 III
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 SATURDAY PICK-UP (Extra charge) [ ]
- 12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1		
Total 1	Total 11	Total

DIM SHIPMENT (Chargeable Weight) [ ] lbs. ___ x ___ x ___

Received At: 1 [ ] Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

7 Release Signature:

Emp. No. Date

[ ] Cash Received

[ ] Return Shipment

[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received FedEx Employee Number

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 11/92
PART #137204 FXEM 3.93
FORMAT #155

155

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9/15/93

9713517.0919

TMA/ARLI
Thermo Analytical Inc.

000005

RADIATION DOSE RATE SURVEY FORM

Date 12/16/93 COMPANY TMA/NORCAL (WHC) OTHER ORD # 7289158030

Surveyor's Name MARK S. MCCRAY

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 4/26/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		32.0			2.0				
Consistency		7,250	0.2799		4,096	0.1505			
Smears: 2340 6406		44.0			2.0			NONE	
Reported WHC:									
2172	Gea-Soil	<1.37000E			00 pCi/gram				(Cs-137)
	Gea-Soil	5.98000E			01 pCi/gram				(U-235)

All OK ✓ Approved MSM

Not OK Date 12/16/93

Comments: Victoreen 450 P Shows 16 μR/hr

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 12-029

Solid Sample #:

B09DQ6

CASE NARRATIVE

In sample B09DQ6 a peak was detected at approximately 1.1 minutes which is believed to be acetate. In accordance with method 300.0, the sample was reanalayzed with the same results and a Martix Spike was performed that identifies and quantifies Fluoride. Since the blanks, the calibration verification standards and the LCS does not contain this peak, it is believed to be derived from the sample. No further action was performed even though the Relative Percent Difference between the sample and the duplicate exceeded the control criteria. All runs on this sample have been included in the raw data section of the package.

No problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish

Maureen Parrish

9713517.0921

000007

TMA Inc. REPORT Work Order # A3-12-029

Received: 12/15/93 02/15/94 13:24:06

REPORT TO: Westinghouse Hanford Company
345 Hills
Richland, WA 99352

ATTEN: Ms. Briana Colley

CLIENT: WHC SAMPLES: 2

COMPANY: Westinghouse Hanford Company

FACILITY:

WORK ID: SAF #93-263

TAKEN: By Westinghouse Staff

TRANS: Federal Express

TYPE: Soil

P.O. #: N3-12-038-SU-AR

INVOICE: under separate cover

PREPARED BY: Thermo Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

ATTEN: Ms. Carole Harris

PHONE: 818-357-3247

Maureen Parrish
CERTIFIED BY

CONTACT: MKP_CIH

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

SAMPLE IDENTIFICATION

01	B09DQ6
01	B09DQ6 MS
01	B09DQ6 MSD
01	B09DQ6
01	B09DQ6 MS
01	B09DQ6 MSD
01	B09DQ6
01	B09DQ6 MS
01	B09DQ6 Duplicate
01	B09DQ6
01	B09DQ6 MS
01	B09DQ6 MSD
01	B09DQ6 RE
02	KBLK1223S
02	Lab Blank
02	LCS

TEST CODES and NAMES used on this workorder

8015E3	8015M (Extractable) Form 3
8015MS	EPA 8015M EXTRACT.
BLKSUM	Method Blank Summary
BNCLPS	CLP Semivol. Solid
IC_AN	Anions Extraction Solids
MOIST	Moisture
PH_S	pH of Solids
WCCLPS	Anions in Solids
WCLCS	Lab Control Sample Summary
WCL_S	Chloride in Solids - WH216
WCQCD	Quality Control Summary
WCQCS	Quality Control Summary
WF_S	Fluoride in Solids
WSO4_S	Sulfate (in Solids)

TMA Inc. REPORT Work Order # A3-12-029

Received: 12/15/93

Results by Sample

SAMPLE ID B09DQ6 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/09/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	11.5	mg/kg	1.0
Fluoride	300.0	8.1	mg/kg	0.5
Sulfate	300.0	30	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A3-12-029

Received: 12/15/93

Results by Sample

SAMPLE ID B09DQ6 RE FRACTION 01M TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/09/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	10.9	mg/kg	1.0
Fluoride	300.0	11.3	mg/kg	0.5
Sulfate	300.0	30	mg/kg	5

FORM I

000075

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 15, 1993

1.0 DESCRIPTION OF CASE :

One soil sample was analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ6	A3-12-029-01A	V	SOIL
B09DQ6 MS	A3-12-029-01B	V	SOIL
B09DQ6 MSD	A3-12-029-01C	V	SOIL
B09DQ6	A3-12-029-01D	SV	SOIL
B09DQ6 MS	A3-12-029-01E	SV	SOIL
B09DQ6 MSD	A3-12-029-01F	SV	SOIL
B09DQ6	A3-12-029-01J	K	SOIL
B09DQ6 MS	A3-12-029-01K	K	SOIL
B09DQ6 MSD	A3-12-029-01L	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the sample was analyzed as a medium-level soil. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner.

All of the QC results were within the limits specified by the EPA CLP SOW.

000076

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the sample was concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the sample was performed by the analyst prior to injection. The large dilution was necessary based on the viscous nature of the extract. The matrix spikes and surrogates were not recoverable due to the large sample dilution. The blank, SBLK1217S2, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL. A 1:50 dilution was performed on the sample by the analyst prior to injection.

The matrix spiking solution was added at a concentration of approximately 240 ppm. Due to the large concentration of Kerosene in the sample, an accurate recovery of the matrix spiking compounds could not be obtained. The blank spike had

000077

a 66% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the results were reported on a wet weight basis.

All of the other QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish 2/17/94
Maureen Parrish
Project Manager

9713517.0927

000078

EPA SAMPLE NO.

B09DQ6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31223M06

Level: (low/med) MED Date Received: 12/15/93

% Moisture: not dec. 9 Date Analyzed: 12/23/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13000	U
74-83-9	Bromomethane	13000	U
75-01-4	Vinyl Chloride	13000	U
75-00-3	Chloroethane	13000	U
75-09-2	Methylene Chloride	2300	BJ
67-64-1	Acetone	13000	U
75-15-0	Carbon Disulfide	13000	U
75-35-4	1,1-Dichloroethene	13000	U
75-34-3	1,1-Dichloroethane	13000	U
540-59-0	1,2-Dichloroethene (total)	13000	U
67-66-3	Chloroform	13000	U
107-06-2	1,2-Dichloroethane	13000	U
78-93-3	2-Butanone	13000	U
71-55-6	1,1,1-Trichloroethane	13000	U
56-23-5	Carbon Tetrachloride	13000	U
75-27-4	Bromodichloromethane	13000	U
78-87-5	1,2-Dichloropropane	13000	U
10061-01-5	cis-1,3-Dichloropropene	13000	U
79-01-6	Trichloroethene	13000	U
124-48-1	Dibromochloromethane	13000	U
79-00-5	1,1,2-Trichloroethane	13000	U
71-43-2	Benzene	13000	U
10061-02-6	trans-1,3-Dichloropropene	13000	U
75-25-2	Bromoform	13000	U
108-10-1	4-Methyl-2-Pentanone	13000	U
591-78-6	2-Hexanone	13000	U
127-18-4	Tetrachloroethene	13000	U
79-34-5	1,1,2,2-Tetrachloroethane	13000	U
108-88-3	Toluene	13000	U
108-90-7	Chlorobenzene	13000	U
100-41-4	Ethylbenzene	13000	U
100-42-5	Styrene	13000	U
1330-20-7	Xylene (total)	13000	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31223M06

Level: (low/med) MED Date Received: 12/15/93

% Moisture: not dec. 9 Date Analyzed: 12/23/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SUBSTITUTED CYCLOHEXANE	13.30	22000	J
2.	UNKNOWN HYDROCARBON	14.45	16000	J
3.	SUBSTITUTED CYCLOHEXANE	15.88	29000	J
4.	SUBSTITUTED CYCLOHEXANE	16.60	18000	J
5.	UNKNOWN HYDROCARBON	18.10	22000	J
6.	SUBSTITUTED CYCLOHEXANE	18.23	33000	J
7.	UNKNOWN HYDROCARBON	18.70	15000	J
8.	UNKNOWN ALKANE	19.05	44000	J
9.	UNKNOWN POLYNUCLEAR AROMATIC	19.43	74000	J
10.	UNKNOWN HYDROCARBON	20.60	76000	J

9713517.0929

000080

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01D

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31228I06

Level: (low/med) LOW Date Received: 12/15/93

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/17/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 9.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	29000	U
111-44-4	bis(2-Chloroethyl)Ether	29000	U
95-57-8	2-Chlorophenol	29000	U
541-73-1	1,3-Dichlorobenzene	29000	U
106-46-7	1,4-Dichlorobenzene	29000	U
95-50-1	1,2-Dichlorobenzene	29000	U
95-48-7	2-Methylphenol	29000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	29000	U
106-44-5	4-Methylphenol	29000	U
621-64-7	N-Nitroso-Di-n-Propylamine	29000	U
67-72-1	Hexachloroethane	29000	U
98-95-3	Nitrobenzene	29000	U
78-59-1	Isophorone	29000	U
88-75-5	2-Nitrophenol	29000	U
105-67-9	2,4-Dimethylphenol	29000	U
111-91-1	bis(2-Chloroethoxy)Methane	29000	U
120-83-2	2,4-Dichlorophenol	29000	U
120-82-1	1,2,4-Trichlorobenzene	29000	U
91-20-3	Naphthalene	29000	U
106-47-8	4-Chloroaniline	29000	U
87-68-3	Hexachlorobutadiene	29000	U
59-50-7	4-Chloro-3-Methylphenol	29000	U
91-57-6	2-Methylnaphthalene	29000	U
77-47-4	Hexachlorocyclopentadiene	29000	U
88-06-2	2,4,6-Trichlorophenol	29000	U
95-95-4	2,4,5-Trichlorophenol	69000	U
91-58-7	2-Chloronaphthalene	29000	U
88-74-4	2-Nitroaniline	69000	U
131-11-3	Dimethylphthalate	29000	U
208-96-8	Acenaphthylene	29000	U
99-09-2	3-Nitroaniline	69000	U
83-32-9	Acenaphthene	29000	U
51-28-5	2,4-Dinitrophenol	69000	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01D

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31228I06

Level: (low/med) LOW Date Received: 12/15/93

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/17/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 9.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	69000	U
132-64-9	Dibenzofuran	29000	U
121-14-2	2,4-Dinitrotoluene	29000	U
606-20-2	2,6-Dinitrotoluene	29000	U
84-66-2	Diethylphthalate	29000	U
7005-72-3	4-Chlorophenyl-phenylether	29000	U
86-73-7	Fluorene	29000	U
100-01-6	4-Nitroaniline	69000	U
534-52-1	4,6-Dinitro-2-methylphenol	69000	U
86-30-6	N-Nitrosodiphenylamine (1)	29000	U
101-55-3	4-Bromophenyl-phenylether	29000	U
118-74-1	Hexachlorobenzene	29000	U
87-86-5	Pentachlorophenol	69000	U
85-01-8	Phenanthrene	29000	U
120-12-7	Anthracene	29000	U
86-74-8	Carbazole	29000	U
84-74-2	Di-n-Butylphthalate	29000	U
206-44-0	Fluoranthene	29000	U
129-00-0	Pyrene	29000	U
85-68-7	Butylbenzylphthalate	29000	U
91-94-1	3,3'-Dichlorobenzidine	29000	U
56-55-3	Benzo(a)Anthracene	29000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	29000	U
218-01-9	Chrysene	29000	U
117-84-0	Di-n-Octyl Phthalate	29000	U
205-99-2	Benzo(b)Fluoranthene	29000	U
207-08-9	Benzo(k)Fluoranthene	29000	U
50-32-8	Benzo(a)Pyrene	29000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	29000	U
53-70-3	Dibenz(a,h)Anthracene	29000	U
191-24-2	Benzo(g,h,i)Perylene	29000	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01D

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31228I06

Level: (low/med) LOW Date Received: 12/15/93

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/17/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 9.3

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKANE	7.12	240000	J
2.	UNKNOWN ALKANE	8.88	660000	J
3.	UNKNOWN HYDROCARBON	9.47	270000	J
4.	UNKNOWN HYDROCARBON	9.55	250000	J
5.	UNKNOWN ALKANE	9.92	200000	J
6.	UNKNOWN ALKANE	10.55	1200000	J
7.	UNKNOWN ALKANE	10.72	810000	J
8.	UNKNOWN ALKENE	10.92	210000	J
9.	UNKNOWN CYCLIC HYDROCARBON	11.18	270000	J
10.	UNKNOWN HYDROCARBON	11.32	260000	J
11.	UNKNOWN ALCOHOL	11.48	290000	J
12.	UNKNOWN ALKANE	11.62	980000	J
13.	UNKNOWN ALKANE	12.07	1400000	J
14.	UNKNOWN ALKANE	12.25	240000	J
15.	UNKNOWN ALCOHOL	12.73	330000	J
16.	UNKNOWN ALKANE	13.12	630000	J
17.	UNKNOWN ALKANE	13.48	990000	J
18.	PHOSPHORIC ACID ESTER	18.02	3900000	J
19.	UNKNOWN ALKANE	14.27	360000	J
20.	UNKNOWN ALKANE	14.80	420000	J

9713517.0952

000348

TMA Inc. REPORT Work Order # A3-12-029

Received: 12/15/93

Results by Sample

SAMPLE ID B09DQ6 FRACTION 01J TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/09/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	11000	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.0933

 Skinner&Sherman REPORT Work Order # S3-12-148

Received: 12/16/93 02/02/94 09:20:45

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 2
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254
ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N3-12-038
TAKEN By Client
TRANS Fedex
TYPE 1 Soil
P.O. # N3-12-038
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B09DQ6
01 B09DQ6D
01 B09DQ6S
02 LCSS

TEST CODES and NAMES used on this workorder

NITR S Nitrate/Nitrite in Soils

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.0934

Received: 12/16/93

Results by Sample

SAMPLE ID B09D06 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/09/93 Category SOIL

NITR_S <2.49
mg N/kg

SAMPLE ID B09D06D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 12/09/93 Category SOIL

NITR_S <2.50
mg N/kg

SAMPLE ID B09D06S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 12/09/93 Category SOIL

NITR_S 22.4
mg N/kg

SAMPLE ID LCSS SAMPLE # 02 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.0935

Received: 12/16/93 02/02/94 09:20:45

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S312148-01	<2.49 mg/kg	19.9 mg/kg	22.4 mg/kg	112.6

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S312148-01	<2.49 mg/kg	<2.50 mg/kg	not calculable

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.07 mg/L	103.5
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

Received: 12/16/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.0937

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-12-148 Client Hanford Work Number/Type of Samples 1 Soil
Protocol CLP Turnaround 33 Cooler Temp: 4 °C, or N/A Cooler Yes/No
Custodian: D. Martinez Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# W3-12-038
Purchase Order/Contract# Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA, #

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/16/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09006	soil	12/16/93	NA	NO3, NO2 (O,S)	
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

complete
DPM 12/16/93

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes ✓ No

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

9713517.0938

TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-038

RCVD: 12/15/93 DUE: 01/19/94 12/15/93 11:23:07 KEEP: 01/19/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B09DG6	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	B09DG6 MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	B09DG6 DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01H-S	L C S	S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
E Yamamoto	12-15-93	Skinner	12-15-93	D. Martinez	12/16/93

9713517.0939

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

RECORD COPY

FEB 1994
RECEIVED
SDLA

January 26, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) soil sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1993 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S312147.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The matrix spike recoveries for antimony, arsenic, manganese, selenium and silver exceeded the control limit requirements.

The laboratory duplicate for selenium and silver exceeded the control limit requirements.

The ICP serial dilution for sodium and zinc exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

i

DEA 4-7-95

9713517.0940

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: 809DQ6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-038SAS No.: SDG No.: 809DQ6

Matrix (soil/water): SOIL Lab Sample ID: 12147-01S

Level (low/med): LOW Date Received: 12/16/93

% Solids: 91.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7570			P
7440-36-0	Antimony	2.8	U	N	P
7440-38-2	Arsenic	2.1		SN	F
7440-39-3	Barium	80.2			P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	7840			P
7440-47-3	Chromium	1.2	U		P
7440-48-4	Cobalt	9.5	B		P
7440-50-8	Copper	13.6			P
7439-89-6	Iron	13400			P
7439-92-1	Lead	3.0			F
7439-95-4	Magnesium	4240			P
7439-96-5	Manganese	365		N	P
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel	20.7			P
7440-09-7	Potassium	1630			P
7782-49-2	Selenium	1.6		SN*	F
7440-22-4	Silver	7.6		N*	P
7440-23-5	Sodium	552	B	E	P
7440-28-0	Thallium	0.26	U		F
7440-62-2	Vanadium	21.2			P
7440-66-6	Zinc	54.0		E	P
	Cyanide	0.54	U		CA

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

9713517.0941

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289157982

7289157982

RECIPIENT'S COPY

1 Date 12-15-93

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): (415)-235-2633
Company: [illegible]
Department/Floor No.
Street Address: 2[illegible] WRIGHT AVE
City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: ANTONIA
Recipient's Phone Number (Very Important): (617) 890-7200
Company: SKINNER/SHERMAN LAB.
Department/Floor No.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 300 SECOND AVENUE
City: WALTHAM State: MA ZIP Required: 02254-0521

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340 - 6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
11 [X] OTHER PACKAGING
16 [ ] FEDEX LETTER *
12 [ ] FEDEX PAK *
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery!)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER *
52 [ ] FEDEX PAK *
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
30 [ ] ECONOMY

Government Overnight (Restricted for authorized users only)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

* Economy Letter rate not available. Minimum charge: One pound economy rate.

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation requested)
80 [ ] TWO-DAY FREIGHT **

† Delivery commitment may be later in some areas.
*Declared Value Limit $500.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) [ ] (Not available to all locations)
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845, X ____ kg. 904 III
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
[ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1		
Total 1	Total 8	Total

DIM SHIPMENT (Chargeable Weight) [ ] ____ lbs.
L x W x H

Received At: [X] 1 Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X [signature]
Date/Time Received: 12/16/93 10:00
FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 11/92
PART #137204 FXEM 3 93
FORMAT #155
155
© 1992-93 FEDEX
PRINTED IN U.S.A.

7 Release Signature:

172

9713512 0012

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-12-147 Client Hanford WOC Number/Type of Samples 1 soil
Protocol CLP Turnaround 33 days Cooler Temp: 4 °C, or N/A Cooler Yes/No
Custodian: D. Martineau Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# W3-12-038
Purchase Order/Contract# Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/16/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09DQ6	soil	12/16/93	NA	CLP metals + D.S.	
2						
3						
4						
5						
6						
7						
8						
9					Complete	
10						
11						
12					DRM 12/16/93	
13						
14						
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes ✓ No

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

9713517.0943

TMA

JAN 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS & GENERAL CHEMISTRY
Case No. 12-010
(TMA/ARLI W.O. No. A3-12-010)

METALS & NITRATE/NITRITE
Case No. N3-12-019
(TMA/Skinner & Sherman W.O. Nos. S3-12-088 & S3-12-089)

January 27, 1994

TMA Master Work Order N3-12-019

L
DSA 4-7-95

9713517.0944

000002

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-019

RCVD: 12/08/93 DUE: 01/12/94 12/08/93 14:40:05 KEEP: 01/12/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09DQ0	ARLI	WH014	WH016	WH195	WH232
01C-S	B09DQ0 MS	ARLI	WH014	WH016	WH195	WH232
01D-S	B09DQ0 MSD	ARLI	WH014	WH016	WH195	
01E-S	B09DQ0 DUP	ARLI	WH232			
02A-S	B09DQ1	ARLI	WH014	WH016	WH195	WH232
03A-S	B09DP9	ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	12-8-93	ARLI	12-8-93	PUS	12-9-93

9713517.0945

000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-03-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322291

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml ~~Gs:VOA CLP~~
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-03-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Karen E. Rogers 12-07-93	J.D. Fambrough	12/7/93 1309
Relinquished by: D/7/93 J.D. Fambrough 1335	Received by: H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0946

000002B

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS — S.A.F. # 93-263 — Date 12-03-93

Company Contact L E ROGERS — Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DP9	S	12-03-93	0700 ~~0950~~ LER 12-03-93	~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ 1,250ml Gs:VOA CLP ~~1,250ml aG:Semi-VOA CLP~~ ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~ ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ ~~1,125ml G:Cyanide CLP~~ ~~1,125ml Gw:Kerosene (8015M)~~ ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~ LER 12-03-93
B09DQ0	S	12-03-93	0950	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			LER 12-03-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample				
	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

9713517.0947

000002C

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-06-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 997332291 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

SER 12-06-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

SER 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Loren Rogers 12-7-93	J.D. Fanther J.D. Fanther	12/7/93 1305
Relinquished by: 12/7/93 J.D. Fanther J.D. Fanther 1335	Received by: Jesus Ore/H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0946

0000022

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 12-06-93

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
809DQ1	S	12-06-93	0955	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			SER 12-06-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			SER 12-06-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample					
	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

9713517.0949

000003

SAMPLE LOG-IN SHEET

LAB NAME : TMAVARU

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D. WHITAKER

LOG-IN-DATE : 12-9-93

RECEIVED BY (SIGNATURE): K. Whitaker

ICE CHEST NO. SML-369

REMARKS:

1. Custody Seal(s) Present / Absent* Intact / Broken
2. Custody Seal Nos:
3. Chain of Custody Records Present / Absent*
4. Traffic Reports or Packing List Present / Absent*
5. Airbill Airbill / Sticker Present / Absent*
6. Airbill No.: 7289157595
7. Sample Tags Present / Absent*
8. Sample Tag Numbers Listed / Not Listed on Chain of Custody
9. Sample Condition: Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? Yes / No*
11. Date Recieved at Lab: 12-9-93
12. Temp of Ice chest 3 °C
13. Time Recieved: 0900

SAMPLE TRANSFER

Fraction:

Area #:

By:

On:

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B09090	A312010	
	B09091	A312010	
	C309	A312011	
	B09P9	A312010	

* Contact SMO and attach record of resolution

Reviewed By:

Date:

Logbook No.:

Logbook Page No.:

FORM DC-1

000004

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289157595

7289157595

RECIPIENT'S COPY

1 Date 12-08-93

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): (619)235-2633
Company: TMA/NORCAL
Department/Floor No.
Street Address: 2939 WRIGHT AVE
City: SAN DIEGO State: CA ZIP Required: 92104

2 To (Recipient's Name) Please Print: CAROLE HARRIS
Recipient's Phone Number (Very Important): (818) 357-3247
Company: TMA/AKLI
Department/Floor No.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 TAYLOR STREET
City: MONROVIA State: CA. ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
11 [X] OTHER PACKAGING
16 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
30 [ ] ECONOMY
* Economy Letter rate not available. Minimum charge: One pound economy rate.

Government Overnight (Restricted for authorized users only)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**
† Delivery commitment may be later in some areas.
*Declared Value Limit $500.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) [ ] (Not available to all locations)
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845, ____ X ____ kg. 904 III
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
[ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	57	
Total 1	Total 57	Total

DIM SHIPMENT (Chargeable Weight) [ ] lbs
L x W x H

Received At
[X] 1 Regular Stop
2 [ ] On-Call Stop
3 [ ] Drop Box
4 [ ] B.S.C
5 [ ] Station

7 Release Signature:

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 11/92
PART #137204 FXEM 3/93
FORMAT #155
155
© 1992-93 FEDEX PRINTED IN U.S.A.

97 2577 1090

9713517.0951

TMA/ARLI
Thermo Analytical Inc.

000005

RADIATION DOSE RATE SURVEY FORM

Date 12/09/93 COMPANY TMA NORCAL OTHER ORD # 7289157595

Surveyor's Name MARK S. MCCRAY

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 4/26/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		31.0			0				
Consistency		7,350	0.2337		5,010	0.1841			
Smears: SML 369		50.0			5.0			NONE	
Reported WHC:									
	(4) samples w/ TOTAL ACTIVITY =								
			< 50 pCi/gram						

All OK ✓ Approved MSM Comments: Victoreen 450 P shows 13 μR/h

Not OK Date 12/09/93 MSM 12/09/93

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 12-010

Soil Sample #s:

B09DQ0 B09DQ1

CASE NARRATIVE

No problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish

Maureen Parrish

9713517.0953

000007

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93 01/21/94 12:22:31

REPORT TO: Westinghouse Hanford Company
345 Hills
Richland, WA 99352

ATTEN: Jeanette Duncan

CLIENT: WHC SAMPLES: 4
COMPANY: Westinghouse Hanford Company
FACILITY:

WORK ID: SAF #93-263 CLP
TAKEN: By Westinghouse Staff
TRANS: Federal Express
TYPE: Soil
P.O. #: N3-12-019-SU-AR
INVOICE: under separate cover

PREPARED BY: Thermo Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

ATTEN: Ms. Carole Harris
PHONE: 818-357-3247

Maureen Parrish
CERTIFIED BY

CONTACT: MKP_CIH

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

SAMPLE IDENTIFICATION

01	B09DP9
01	B09DP9 MS
01	B09DP9 MSD
02	B09DQ0
02	B09DQ0 MS
02	B09DQ0 MSD
02	B09DQ0
02	B09DQ0 MS
02	B09DQ0
03	B09DQ1
03	B09DQ1 Duplicate
03	B09DQ1
03	B09DQ1 MS
03	B09DQ1 MSD
04	Lab Blank
04	LCS
04	OBLK1216K

TEST CODES and NAMES used on this workorder

8015E3	8015M (Extractable) Form 3
8015MS	EPA 8015M EXTRACT.
BLKSUM	Method Blank Summary
BNCLPS	CLP Semivol. Solid
IC_AN	Anions Extraction Solids
WCCLPS	Anions in Solids
WCLCS	Lab Control Sample Summary
WCL_S	Chloride in Solids - WH216
WCQCD	Quality Control Summary
WCQCS	Quality Control Summary
WF_S	Fluoride in Solids
WMOIST	Moisture
WPH_S	pH of Solids
WSO4_S	Sulfate (in Solids)

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ0 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/03/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	8.2	mg/kg	1.0
Fluoride	300.0	1.5	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

FORM I

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000010

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ1 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/06/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	15.2	mg/kg	1.0
Fluoride	300.0	1.1	mg/kg	0.5
Sulfate	300.0	40	mg/kg	5

FORM I

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-010

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 8, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP9	A3-12-010-01A	V	SOIL
B09DP9 MS	A3-12-010-01B	V	SOIL
B09DP9 MSD	A3-12-010-01C	V	SOIL
B09DQ0	A3-12-010-02A	V	SOIL
B09DQ0	A3-12-010-02B	SV	SOIL
B09DQ0 MS	A3-12-010-02C	SV	SOIL
B09DQ0 MSD	A3-12-010-02D	SV	SOIL
B09DQ0	A3-12-010-02G	K	SOIL
B09DQ1	A3-12-010-03A	V	SOIL
B09DQ1	A3-12-010-03B	SV	SOIL
B09DQ1	A3-12-010-03E	K	SOIL
B09DQ1 MS	A3-12-010-03F	K	SOIL
B09DQ1 MSD	A3-12-010-03G	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Low concentrations of Di-n-Butylphthalate were detected in the blank and all the samples that were tested for semivolatiles.

The surrogate recovery for Terphenyl-d14 on sample B09DQ0MSD, was above the contract required QC limits. In accordance with CLP protocol no further action was taken.

The spike recoveries for sample B09DQ0MSD, were above the QC limits for Phenol, 4-Nitrophenol, and 2,4-Dinitrotoluene. The results for 4-Nitrophenol have been "E" qualified since the actual concentration detected in the MSD exceeded the calibration of the instrument. The %RPD for 1,2,4-Trichlorobenzene and Acenaphthene were slightly above the QC limits. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

No Kerosene was detected in any of the samples. Sample B09DQ1 was spiked with Kerosene. The matrix spike recoveries were 69% and 70%. The blank spike was prepared at the same time and had an 72% recovery.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish

Maureen Parrish 1/21/94
Project Manager

9715517.0959

000082
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DP9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 0 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	6	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DP9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 0 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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000084

EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R06

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	7	J
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

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000085

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R06

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.78	5	JN

9713517.0963

000086

EPA SAMPLE NO.

B09DQ1

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31213R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/13/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	5	BJ
67-64-1	Acetone	11	U
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

EPA SAMPLE NO.

B09DQ1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31213R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/13/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31220S05

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	840	U

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000089
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31220S05

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	840	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	840	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	110	BJ
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

9713517.0967

1F

000090

EPA SAMPLE NO.

B09DQ0

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31220S05

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	6.53	4400	BJ
2.	UNKNOWN HYDROCARBON	6.88	380	BJ
3.	UNKNOWN HYDROCARBON	7.85	560	BJ
4.	UNKNOWN ALCOHOL	8.23	700	BJ
5.	PROPANOIC ACID ESTER ISOMER	17.17	100	J
6.	UNKNOWN HYDROCARBON	22.78	70	BJ
7.	UNKNOWN HYDROCARBON	23.17	100	BJ
8.	HEXANEDIOIC ACID ESTER ISOME	25.30	280	BJ
9.	UNKNOWN ALKANE	27.93	140	J
10.	UNKNOWN ALKANE	30.27	380	J

9713517.0968

000091

EPA SAMPLE NO.

B09DQ1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03B

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 31220S08

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03B

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 31220S08

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	830	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	830	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	130	BJ
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
218-01-9	Chrysene	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

9713517.0970

~~[illegible]~~ 000093 SF 1-21-94

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03B

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 31220S08

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	6.57	5000	BJ
2.	UNKNOWN HYDROCARBON	6.90	410	BJ
3.	UNKNOWN HYDROCARBON	7.05	100	BJ
4.	UNKNOWN HYDROCARBON	7.88	620	BJ
5.	UNKNOWN ALCOHOL	8.25	790	BJ
6.	PROPANOIC ACID ESTER ISOMER	17.18	140	J
7.	UNKNOWN HYDROCARBON	21.67	69	J
8.	HEXANEDIOIC ACID ESTER ISOME	25.32	140	BJ
9.	UNKNOWN HYDROCARBON	27.97	69	J
10.	UNKNOWN ALKANE	30.30	240	J

9713517.0971

000407

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ0 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/03/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 12/30/93
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ1 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/06/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 12/30/93
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.0973

 Skinner&Sherman REPORT Work Order # S3-12-089

Received: 12/09/93 01/26/94 14:55:16

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 3
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254
ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N3-12-019
TAKEN By Client
TRANS Fedex
TYPE 2 Soils
P.O. # N3-12-019
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B09DQ0
02 B09DQ1
02 B09DQ1D
02 B09DQ1S
03 LCSS

TEST CODES and NAMES used on this workorder

NITR S Nitrate/Nitrite in Soils

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.0974

 Skinner&Sherman REPORT Work Order # S3-12-089

Received: 12/09/93 Results by Sample

SAMPLE ID B09D00 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 7.08
mg N/kg

SAMPLE ID B09D01 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 12.8
mg N/kg

SAMPLE ID B09D01D SAMPLE # 02 FRACTIONS: B
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 12.5
mg N/kg

SAMPLE ID B09D01S SAMPLE # 02 FRACTIONS: C
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 31.8
mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.0975

Received: 12/09/93 01/26/94 14:55:16

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S312089-02	12.8 mg/kg	19.7 mg/kg	31.8 mg/kg	96.5

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S312089-02	12.8 mg/kg	12.5 mg/kg	2.4

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.07 mg/L	103.5
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

97 3517.0976

Received: 12/09/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

97-3517.0977

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-12-089 (DRM 12/09/93) Client Hanford Nos Number/Type of Samples 2 soils
Protocol CLP Turnaround 33 days Cooler Temp: 11 °C, or N/A Cooler Yes/No
Custodian: D. Martinez Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# N3-12-019
Purchase Order/Contract# N3-12-019 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/09/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09D00	Soil	12/09/93	WA	AB 12/10/93 ~~Anions~~ NO3NO2	
2	B09D01	↓	↓	↓	↓ D.S	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes No ✓

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7 Page:

024

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # M3-12-019

RCVD: 12/08/93 DUE: 01/12/94 12/08/93 14:41:01 KEEP: 01/12/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B09DQ0	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	B09DQ0 MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	B09DQ0 DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01H-S	L C S	S&S	WH001	WH002	WH004	WH005	WH233	WH390
02B-S	B09DQ1	S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Neil M Lieck	12-8-93	S&S	12-8-93	D. Martinez	12/09/93

TMA 97.3517.0979
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

RECORD COPY

JAN 1994
RECEIVED
SDLA

January 19, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Two (2) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 9, 1993 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S312088.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The digestion spike recoveries for antimony and barium exceeded control limit requirements.

The laboratory duplicate exceeded control limit requirements for arsenic, barium, and chromium.

The ICP serial dilution exceeded the control limit requirement for zinc.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

i
DPA
4-7-95

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809DQ0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-019SAS No.: SDG No.: 809DQ0

Matrix (soil/water): SOIL Lab Sample ID: 12088-01S

Level (low/med): LOW Date Received: 12/09/93

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7400			P
7440-36-0	Antimony	2.7	U	N	P
7440-38-2	Arsenic	8.8		*	P
7440-39-3	Barium	102		N*	P
7440-41-7	Beryllium	0.41	B		P
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	14500			P
7440-47-3	Chromium	9.1		*	P
7440-48-4	Cobalt	13.2			P
7440-50-8	Copper	18.0			P
7439-89-6	Iron	23500			P
7439-92-1	Lead	7.4			P
7439-95-4	Magnesium	6610			P
7439-96-5	Manganese	421			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.0			P
7440-09-7	Potassium	1360			P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	1.5	B		P
7440-23-5	Sodium	328	B		P
7440-28-0	Thallium	1.6	B		P
7440-62-2	Vanadium	58.3			P
7440-66-6	Zinc	49.3		E	P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1880			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

002

WESTINGHOUSE/HANFORD

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809DQ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-019SAS No.: SDG No.: 809DQ0

Matrix (soil/water): SOIL Lab Sample ID: 12088-02S

Level (low/med): LOW Date Received: 12/09/93

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7560			P
7440-36-0	Antimony	2.7	U	N	P
7440-38-2	Arsenic	9.1		*	P
7440-39-3	Barium	1070		N*	P
7440-41-7	Beryllium	0.42	B		P
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	9270			P
7440-47-3	Chromium	11.6		*	P
7440-48-4	Cobalt	14.6			P
7440-50-8	Copper	18.2			P
7439-89-6	Iron	26500			P
7439-92-1	Lead	4.9			P
7439-95-4	Magnesium	5940			P
7439-96-5	Manganese	421			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	11.1			P
7440-09-7	Potassium	1370			P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	1.8	B		P
7440-23-5	Sodium	334	B		P
7440-28-0	Thallium	1.8	B		P
7440-62-2	Vanadium	69.8			P
7440-66-6	Zinc	50.3		E	P
	Cyanide	0.50	U		CA
7440-32-6	Titanium	2100			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

003

97 3517 0982

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289154949

7289154974

RECIPIENT'S COPY

1 Date 12-08-93

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (310-)335-2637

Company: [illegible]

Department/Floor No.:

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: ANTONIA

Recipient's Phone Number (Very Important): (617) 899-7200

Company: SKINNER/SHERMAN LAB

Department/Floor No.:

Exact Street Address (We Cannot Deliver To P.O. Boxes or P.O. Zip Codes.): 300 SECOND AVENUE

City: WALTHAM State: MA ZIP Required: 02451-0951

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 334-6466

H IF HOLD FOR PICK-UP Print FEDEX Address Here

Street Address

City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning*)
- 11 [X] OTHER PACKAGING
- 16 [ ] FEDEX LETTER *
- 12 [ ] FEDEX PAK *
- 13 [ ] FEDEX BOX
- 14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
- 51 [ ] OTHER PACKAGING
- 56 [ ] FEDEX LETTER *
- 52 [ ] FEDEX PAK *
- 53 [ ] FEDEX BOX
- 54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
- 30 [ ] ECONOMY*

*Economy Letter rate not available. Minimum charge: One pound economy rate.

Government Overnight* (Restricted for authorized use/activity)
- 46 [ ] GOVT LETTER
- 47 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
- [ ] OVERNIGHT FREIGHT** (Advance reservation required)
- 80 [ ] TWO-DAY FREIGHT**

†Commitment may vary in some areas. *Declared Value Limit $500. **Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 [ ] HOLD FOR PICK-UP (Fill in Box H)
- 2 [X] DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
- 4 [ ] DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE — Dangerous Goods Shipper's Declaration not required. Dry Ice, 9, UN 1845, X ___ kg. 904 III
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 [ ] SATURDAY PICK-UP (Extra charge)
- [ ]
- 12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	4lb	
Total	Total	Total
1	4lb	

DIM SHIPMENT (Chargeable Weight) [ ] lbs. L x W x H

Received At: 1 [X] Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

Emp. No. Date

[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received FedEx Employee Number

7 Release Signature:

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 11/92
PART #137204 FXEM 3/93
FORMAT #155

155

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97.3517.0983

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-12-088 Client Hanford NOC Number/Type of Samples 2 soils
Protocol CLP Turnaround 33 60 Day Cooler Temp: 4 °C, or N/A Cooler Yes/No
Custodian: D. Martineau Shipper & # Fedex SDG/Batch# 1
Custody Seal: Present/Absent/Intact/Not Client Case# N3-12-019
Purchase Order/Contract# N3-12-019 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA, #

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/09/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09000	soil	12/09/93	NA	CLP metals + CN	
2	B09001	↓	↓	1	↓	
3						
4						
5						
6						
7						
8						
9						
10					Complete	
11						
12						
13				DRM	12/09/93	
14						
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No ____
These samples have detectable amounts of Radioactive Material: Yes ____ No ✓

Subcontract: Yes/No, To: ____ Date: ____

Reviewed ____ Date ____

232

* EPA/CLP required

Rev 1.7 Page:

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-019

RCVD: 12/08/93 DUE: 01/12/94 12/08/93 14:41:01 KEEP: 01/12/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B09DQ0	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	B09DQ0 MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	B09DQ0 DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01H-S	L C S	S&S	WH001	WH002	WH004	WH005	WH233	WH390
02B-S	B09DQ1	S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	12-8-93	S&S	12-8-93	D. Martinez	12/09/93

9413517.0985

FEB 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS & GENERAL CHEMISTRY
Case No. 12-044
(TMA/ARLI W.O. No. A3-12-044)

METALS & NITRATE/NITRITE
Case No. N3-12-059
(TMA/Skinner & Sherman W.O. Nos. S3-12-192 & S3-12-193)

February 23, 1994

TMA Master Work Order N3-12-059

RECORD COPY

9313517.0986

000002

TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-059

J: 12/20/93 DUE: 01/24/94 12/20/93 14:42:11 KEEP: 01/24/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09DR0	ARLI	WH014	WH016	WH195	WH232
02A-S	B09DR1	ARLI	WH014	WH016	WH195	WH232
03A-S	B09DR3	ARLI	WH014	WH016	WH195	WH232
04A-S	B09DG7	ARLI	WH014	WH016	WH195	WH232
05A-S	B09DG8	ARLI	WH014	WH016	WH195	WH232
06A-S	B09DG9	ARLI	WH014	WH016	WH195	WH232
06C-S	B09DG9 MS	ARLI	WH014	WH016	WH195	WH232
06D-S	B09DG9 MSD	ARLI	WH014	WH016	WH195	
06E-S	B09DG9 DUP	ARLI	WH232			
07A-W	B09DR2	ARLI	WH014			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Eyamamoto	12-20-93	ARLI	12-20-93	D S	12/21/93

9413517.0997 00000 2A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-15-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- ~~1,250ml aG:Semi-VOA CLP~~
- ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- ~~1,125ml G:Cyanide CLP~~
- ~~1,125ml Gw:Kerosene (8015M)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3) ~~B09~~

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-14-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 Loren E. Rogers 1200	W. V. Seltzer	12-17-93 1200
W. V. Seltzer	Ramirez	12-20-93 8:00

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Rec'd SATURDAY BUT opened 12-20-93 12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0988 0000002B

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DR1	S	12-15-93	0815	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09DR2	S	12-15-93	0830	~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ 1,250ml Gs:VOA CLP ~~1,250ml aG:Semi-VOA CLP~~ ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~ ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ ~~1,125ml G:Cyanide CLP~~ ~~1,125ml Gw:Kerosene (8015M)~~ ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~
			LER 12-16-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other
DL = Drum Liquids O = Oil SL = Sludge W = Water
DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards

A-6000-406 (06/91) WEF060

9413517.0989

000002C

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-14-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DR3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0990

00000 PD

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 12-15-93

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DR3	S	12-15-93	1000	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-15-93

*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other
DL = Drum Liquids O = Oil SL = Sludge W = Water
DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards RADIOACTIVE

A-6000-406 (06/91) WEF060

9413517.0991 000002

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-07-93

Ice Chest No.: SML 386 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251 9008118 — Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) ~~R~~ NONE NOTED 12-07-93

Sample Identification

1) B09DQ2

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-07-93

3)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 Joan E. Rogers 1200	W.V. Setzer	12-17-93 1200
W.V. Setzer	[illegible]	12-20-93 8:00

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Real SATURDAY RUT opened 12-20-93
12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9215517 2592 2614900817 3 000002F

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DQ2	S	12-07-93	1050	~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ ~~1,250ml Gs:VOA CLP~~ ~~1,250ml aG:Semi-VOA CLP~~ ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~ ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ ~~1,125ml G:Cyanide CLP~~ ~~1,125ml Gw:Kerosene (8015M)~~ 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

DER 12-07-93

*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other
DL = Drum Liquids O = Oil SL = Sludge W = Water
DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

9213517.0993

0000029

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Karen E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0994

0000024

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS — S.A.F. # 93-263 — Date 12-13-93

Company Contact L E ROGERS — Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DQ7	S	12-13-93	1204	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			LER 12-13-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample					
	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards

A-6000-406 (06/91) WEF060

9213517.0995 0000097

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ8

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0945 Doreen E Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0996

000002J

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DQ8	S	12-13-93	0757	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			12-13-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other
DL = Drum Liquids O = Oil SL = Sludge W = Water
DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards RADIOACTIVE

A-6000-406 (06/91) WEF060

9213517.0997

000002H

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-14-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ9

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR0

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml ~~P:CLP;TAL~~ Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

JEP 12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Lorene E. Page 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.0998

00000024

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 12-15-93

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DQ9	S	12-14-93	0843	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
B09DR0	S	12-14-93	1231	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			12-15-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other
DL = Drum Liquids O = Oil SL = Sludge W = Water
DS = Drum Solids S = Soil SO = Solid WI = Wipe

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards RADIOACTIVE

A-6000-406 (06/91) WEF060

9713517.0999

000003

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARL

PAGE : 1 OF 2

RECEIVED BY (PRINT NAME): PAYAM SHADI

LOG-IN-DATE : 12-21-93

RECEIVED BY (SIGNATURE): Payam Shadi

ICE CHEST NO. SML413

REMARKS:

1. Custody Seal(s) — Present / Absent* Intact / Broken
2. Custody Seal Nos: _____
3. Chain of Custody Records — Present / Absent*
4. Traffic Reports or Packing List — Present / Absent*
5. Airbill — Airbill / Sticker Present / Absent*
6. Airbill No.: 7289153480
7. Sample Tags — Present / Absent*
8. Sample Tag Numbers — Listed / Not Listed on Chain of Custody
9. Sample Condition: Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? — Yes / No*
11. Date Recieved at Lab: 12/21/93
12. Temp of ice chest 4 °C
13. Time Recieved: 9:30

SAMPLE TRANSFER

Fraction: _____

Area #: _____

By: _____

On: _____

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B09LH8	A312043	& A312041
	B09DR0	A312044	
	B09DR1	A312044	
	B09DQ7	A312044	
	B09DR3	A312044	
	B09DQ8	A312044	
	B09DQ9	A312044	
	B09LJ0	A312043	& A312041
	B09LH9	A312043	& A312041
	B09DR2	A312044	

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM QC-1

9713517.1000

000004

SAMPLE LOG-IN SHEET WHC

LAB NAME : TMA/ARLI

PAGE : 2 OF 2

RECEIVED BY (PRINT NAME): PAYAM SHAGI

LOG-IN-DATE : 12-21-93

RECEIVED BY (SIGNATURE):

ICE CHEST NO. SML ~~[illegible]~~ 413

		CORRESPONDING		
	EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC

REMARKS:

1. Custody Seal(s) — Present / Absent* Intact / Broken
2. Custody Seal Nos: _____
3. Chain of Custody Records — Present / Absent*
4. Traffic Reports or Packing List — Present / Absent*
5. Airbill — Airbill / Sticker Present / Absent*
6. Airbill No.: 72 89153486
7. Sample Tags — Present / Absent*
8. Sample Tag Numbers — Listed / Not Listed on Chain of Custody
9. Sample Condition: Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? — Yes / No*
11. Date Recieved at Lab: 12/21/93
12. Temp of Ice chest 4 °C
13. Time Recieved: 9:30

MP,
Per Payam this DCI is a continuation of ~~the~~ page 1. (See the back side of originals) Both pages refer to the same Id's.
R

SAMPLE TRANSFER

Fraction: _____

Area #: _____

By: _____

On: _____

Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM DC-1

000005

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289153480

7289153480

RECIPIENT'S COPY

1 Date 12-20-93

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (310-)[illegible]

Company: [illegible]

Department/Floor No.:

Street Address: [illegible] HT AVE

City: [illegible] State: CA ZIP Required: [illegible]

2 To (Recipient's Name) Please Print: CAROLE HARRIS

Recipient's Phone Number (Very Important): (818) 357-3247

Company: TMA/ARLI

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 - TAYLOR STREET

City: MONROVIA, State: CA. ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address:
City: State: ZIP Required:

3 PAYMENT 1 [x] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
11 [x] OTHER PACKAGING
16 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
30 [ ] ECONOMY*
* Economy Letter rate not available. Minimum charge. One pound economy rate.

Government Overnight (Restricted for authorized users only)
46 [ ] GOV'T LETTER
41 [ ] GOV'T PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**
† Delivery commitment may be later in some areas.
*Declared Value Limit $500.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [x] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, UN 1845, x kg. 904 III
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
[ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	64	
1	45	
Total 2	Total 114	Total

DIM SHIPMENT (Chargeable Weight) [ ] lbs.
L x W x H

Received At
1 [x] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 4 [ ] B.S.C. 5 [ ] Station

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

7 Release Signature:

Federal Express Use:
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 11/92
PART #[illegible]
FORMAT #155
155
© 1992-93 FEDEX
PRINTED IN U.S.A.

001 7154 70

TMA/ARLI
Thermo Analytical Inc.

000006

RADIATION DOSE RATE SURVEY FORM

Date 12/21/93 COMPANY TMA/NORCAL OTHER ORD # 7289153480

Surveyor's Name MARK S. McGraw

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 4/26/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		33.0			3.0				
Consistency		7,310	0.2822		4,093	0.1504			
Smears: SMK 413		57.0			14.0			None	
Reported WHK (7) Samples each <50 pCi/gram									
3 Samples:									
	ID #								
	B09LH9	<2.99 $^{-5}$ µCi/14.2g = 29.9 pCi/14.8g = 2.1 pCi/g							
	B09LH8	2.85 $^{-5}$ µCi/32.8g = 28.5 pCi/32.8g = .88 pCi/g							
	B09LJ0	2.81 $^{-4}$ µCi/22.6g = 2.81 $^{-1}$ nCi/22.6g = 281 pCi/22.6g =							
	12.4 pCi/g								

All OK ✓ Approved MSM

Not OK Date 12/21/93

Comments: VICTOREEN 450 P Shows 14 µR/h MSM 12/21/93

97 3517.1003

TMA/ARLI
Thermo Analytical Inc.

Page 2 of 2

000007

#7289153480

RADIATION DOSE RATE SURVEY FORM

Date 12/21/93 COMPANY TMA NORCAL OTHER ORD # MPS# 989 3826 451

Surveyor's Name MARK S. McGray

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 4/26/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		33.0			3.0				
Consistency		7,310	0.2822		4,093	0.1504			
Smears: SML-000		47.0			5.0			None	
See page one for Rad data.									

Comments: VICTOREEN 450 P Shave 19 μR/h MSM 12/21/93

All OK ✓ Approved MSM

Not OK Date 12/21/93

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 12-044

Solid Sample #s:

B09DQ7	B09DQ8
B09DQ9	B09DR0
B09DR1	B09DR2
B09DR3	

CASE NARRATIVE

In all the samples a peak was detected at approximately 1.1 minutes. The additional peak appears to be acetate. Since the blanks, the calibration verification standards and the LCS do not contain this peak, it reconfirms the peak is due to the sample. As a result of the coelution, the percent RPD between sample B09DR0 and the duplicate was 32.3 percent.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 2/22/94

Maureen Parrish

9213517.1005

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 02/22/94 14:48:57

000009

REPORT TO: Westinghouse Hanford Company, 345 Hills, Richland, WA 99352

ATTEN: Ms. Briana Colley

CLIENT: WHC SAMPLES: 8

COMPANY: Westinghouse Hanford Company

FACILITY:

PREPARED BY: Thermo Analytical, Inc., 160 Taylor Street, Monrovia, CA 91016

ATTEN: Ms. Carole Harris

PHONE: 818-357-3247

Maureen Garrish
CERTIFIED BY

CONTACT: MKP CIH

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

WORK ID: SAF #93-263 CLP
TAKEN: By Westinghouse Staff
TRANS: Federal Express
TYPE: Soil
P.O. #: N3-12-059-SU-AR
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	B09DQ7
01	B09DQ7 MS
01	B09DQ7 MSD
01	B09DQ7
02	B09DQ8
02	B09DQ8 MS
02	B09DQ8 MSD
02	B09DQ8
03	B09DQ9
03	B09DQ9 MS
03	B09DQ9
04	B09DR0
04	B09DR0 Duplicate
04	B09DR0
05	B09DR3
05	B09DR3 MS
05	B09DR3 MSD
06	B09DR1
07	B09DR2
08	KBLK1223S
08	Lab Blank
08	LCS

TEST CODES and NAMES used on this workorder

8015E3	8015M (Extractable) Form 3
8015MS	EPA 8015M EXTRACT.
BLKSUM	Method Blank Summary
BNCLPS	CLP Semivol. Solid
IC AN	Anions Extraction Solids
WCCLPS	Anions in Solids
WCLCS	Lab Control Sample Summary
WCL S	Chloride in Solids - WH216
WCQCD	Quality Control Summary
WCQCS	Quality Control Summary
WF S	Fluoride in Solids
WMOIST	Moisture
WPH L	pH of Liquid
WPH S	pH of Solids
WSO4 S	Sulfate (in Solids)

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DQ7 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/13/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.6	mg/kg	1.0
Fluoride	300.0	7.1	mg/kg	0.5
Sulfate	300.0	16	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DQ8 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/13/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.5	mg/kg	1.0
Fluoride	300.0	7.8	mg/kg	0.5
Sulfate	300.0	14	mg/kg	5

FORM I

9713517.1008

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

000013

SAMPLE ID B09DQ9 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/14/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.0	mg/kg	1.0
Fluoride	300.0	4.3	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

FORM I

9713517.1009

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

000014

SAMPLE ID B09DR0 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/14/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.0	mg/kg	1.0
Fluoride	300.0	2.6	mg/kg	0.5
Sulfate	300.0	10	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample

SAMPLE ID B09DR3 FRACTION 05C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/15/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.1	mg/kg	1.0
Fluoride	300.0	2.5	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample

SAMPLE ID B09DR1 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/15/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.4	mg/kg	1.0
Fluoride	300.0	4.9	mg/kg	0.5
Sulfate	300.0	18	mg/kg	5

FORM I

000083

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-044

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 20, 1993

1.0 DESCRIPTION OF CASE :

Seven soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ7	A3-12-044-01A	V	SOIL
B09DQ7 MS	A3-12-044-01B	V	SOIL
B09DQ7 MSD	A3-12-044-01C	V	SOIL
B09DQ7	A3-12-044-01D	SV	SOIL
B09DQ7	A3-12-044-01F	K	SOIL
B09DQ8	A3-12-044-02A	V	SOIL
B09DQ8	A3-12-044-02B	SV	SOIL
B09DQ8 MS	A3-12-044-02C	SV	SOIL
B09DQ8 MSD	A3-12-044-02D	SV	SOIL
B09DQ8	A3-12-044-02F	K	SOIL
B09DQ9	A3-12-044-03A	V	SOIL
B09DQ9	A3-12-044-03B	SV	SOIL
B09DQ9	A3-12-044-03E	K	SOIL
B09DR0	A3-12-044-04A	V	SOIL
B09DR0 MS	A3-12-044-04G	V	SOIL
B09DR0 MSD	A3-12-044-04H	V	SOIL
B09DR0	A3-12-044-04B	SV	SOIL
B09DR0	A3-12-044-04F	K	SOIL
B09DR3	A3-12-044-05A	V	SOIL
B09DR3	A3-12-044-05B	SV	SOIL
B09DR3	A3-12-044-05E	K	SOIL
B09DR3 MS	A3-12-044-05F	K	SOIL
B09DR3 MSD	A3-12-044-05G	K	SOIL
B09DR1	A3-12-044-06A	V	SOIL
B09DR1	A3-12-044-06B	SV	SOIL
B09DR1	A3-12-044-06D	K	SOIL
B09DR2	A3-12-044-07A	V	SOIL

injection. The large dilutions were necessary based on the viscous nature of the extracts.

The matrix spikes and surrogates were not recoverable for samples B09DQ8, B09DQ8MS, and B09DQ8MSD, due to the large dilutions. The blank, SBLK1223S2, and samples B09DQ7, B09DQ9, B09DR1, and B09DR3, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits. For sample B09DR0, all of the surrogates were diluted out, with the exception of 2-Fluorobiphenyl, Terphenyl-d14, and 1,2-Dichlorobenzene-d4; 2-Chlorophenol-d4 was not diluted out, although the recoveries were still below the QC limits.

In samples B09DQ7, B09DQ9, B09DR1, B09DR3, and SBLK1223S2, the compound 4-Hydroxy-4-methyl-2-pentanone was detected as a Aldol condensation TIC, and therefore "A" qualified. There were several other TICs detected in each sample. In addition, both Diethylphthalate and Di-n-butylphthalate were detected below the CRQL in samples B09DQ7, B09DQ9, B09DR1, B09DR3, and in the blank. In all of the samples, with the exception of sample B09DQ7, the compound Phosphoric Acid Tributyl Ester was detected as a TIC and "N" qualified.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 950ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

A 1:50 dilution of samples B09DQ8, B09DQ9, and B09DR0, was performed in order to bring the results within the linear range of the instrument. Sample B09DR3 was spiked with Kerosene. The matrix spike recoveries ranged from 67% to 68%.

000086

The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 2/23/94
Program Manager

Maureen Parrish 2/22/94
Project Manager

9213517.1015

000087

EPA SAMPLE NO.

B09DQ7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	4	BJ
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M18

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 10 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13000	U
74-83-9	Bromomethane	13000	U
75-01-4	Vinyl Chloride	13000	U
75-00-3	Chloroethane	13000	U
75-09-2	Methylene Chloride	13000	U
67-64-1	Acetone	13000	U
75-15-0	Carbon Disulfide	13000	U
75-35-4	1,1-Dichloroethene	13000	U
75-34-3	1,1-Dichloroethane	13000	U
540-59-0	1,2-Dichloroethene (total)	13000	U
67-66-3	Chloroform	13000	U
107-06-2	1,2-Dichloroethane	13000	U
78-93-3	2-Butanone	13000	U
71-55-6	1,1,1-Trichloroethane	13000	U
56-23-5	Carbon Tetrachloride	13000	U
75-27-4	Bromodichloromethane	13000	U
78-87-5	1,2-Dichloropropane	13000	U
10061-01-5	cis-1,3-Dichloropropene	13000	U
79-01-6	Trichloroethene	13000	U
124-48-1	Dibromochloromethane	13000	U
79-00-5	1,1,2-Trichloroethane	13000	U
71-43-2	Benzene	13000	U
10061-02-6	trans-1,3-Dichloropropene	13000	U
75-25-2	Bromoform	13000	U
108-10-1	4-Methyl-2-Pentanone	13000	U
591-78-6	2-Hexanone	13000	U
127-18-4	Tetrachloroethene	13000	U
79-34-5	1,1,2,2-Tetrachloroethane	13000	U
108-88-3	Toluene	13000	U
108-90-7	Chlorobenzene	13000	U
100-41-4	Ethylbenzene	13000	U
100-42-5	Styrene	13000	U
1330-20-7	Xylene (total)	13000	U

9213517.1018

000090
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M18

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 10 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKANE	17.28	9700	J
2.	UNKNOWN CYCLOALCOHOL	18.08	9700	J
3.	UNKNOWN HYDROCARBON	18.23	14000	J
4.	UNKNOWN ALKANE	18.68	6900	J
5.	UNKNOWN ALKANE	19.03	57000	J
6.	UNKNOWN POLYNUCLEAR AROMATIC	19.42	28000	J
7.	UNKNOWN HYDROCARBON	19.62	9700	J
8.	UNKNOWN HYDROCARBON	20.22	13000	J
9.	UNKNOWN ALKANE	20.40	26000	J
10.	UNKNOWN HYDROCARBON	20.58	61000	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M15

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.2

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	4900	U
74-83-9	Bromomethane	4900	U
75-01-4	Vinyl Chloride	4900	U
75-00-3	Chloroethane	4900	U
75-09-2	Methylene Chloride	4900	U
67-64-1	Acetone	4900	U
75-15-0	Carbon Disulfide	4900	U
75-35-4	1,1-Dichloroethene	4900	U
75-34-3	1,1-Dichloroethane	4900	U
540-59-0	1,2-Dichloroethene (total)	4900	U
67-66-3	Chloroform	4900	U
107-06-2	1,2-Dichloroethane	4900	U
78-93-3	2-Butanone	4900	U
71-55-6	1,1,1-Trichloroethane	4900	U
56-23-5	Carbon Tetrachloride	4900	U
75-27-4	Bromodichloromethane	4900	U
78-87-5	1,2-Dichloropropane	4900	U
10061-01-5	cis-1,3-Dichloropropene	4900	U
79-01-6	Trichloroethene	4900	U
124-48-1	Dibromochloromethane	4900	U
79-00-5	1,1,2-Trichloroethane	4900	U
71-43-2	Benzene	4900	U
10061-02-6	trans-1,3-Dichloropropene	4900	U
75-25-2	Bromoform	4900	U
108-10-1	4-Methyl-2-Pentanone	4900	U
591-78-6	2-Hexanone	4900	U
127-18-4	Tetrachloroethene	4900	U
79-34-5	1,1,2,2-Tetrachloroethane	4900	U
108-88-3	Toluene	4900	U
108-90-7	Chlorobenzene	4900	U
100-41-4	Ethylbenzene	4900	U
100-42-5	Styrene	4900	U
1330-20-7	Xylene (total)	4900	U

EPA SAMPLE NO.

B09DQ9

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M15

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.2

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	18.22	4100	J
2.	UNKNOWN ALKANE	18.22	9200	J
3.	UNKNOWN POLYNUCLEAR AROMATIC	19.40	4100	J
4.	UNKNOWN HYDROCARBON	20.40	2600	J
5.	UNKNOWN HYDROCARBON	20.58	9200	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M06

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 5 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.2

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	5100	U
74-83-9	Bromomethane	5100	U
75-01-4	Vinyl Chloride	5100	U
75-00-3	Chloroethane	5100	U
75-09-2	Methylene Chloride	5100	U
67-64-1	Acetone	5100	U
75-15-0	Carbon Disulfide	5100	U
75-35-4	1,1-Dichloroethene	5100	U
75-34-3	1,1-Dichloroethane	5100	U
540-59-0	1,2-Dichloroethene (total)	5100	U
67-66-3	Chloroform	5100	U
107-06-2	1,2-Dichloroethane	5100	U
78-93-3	2-Butanone	5100	U
71-55-6	1,1,1-Trichloroethane	5100	U
56-23-5	Carbon Tetrachloride	5100	U
75-27-4	Bromodichloromethane	5100	U
78-87-5	1,2-Dichloropropane	5100	U
10061-01-5	cis-1,3-Dichloropropene	5100	U
79-01-6	Trichloroethene	5100	U
124-48-1	Dibromochloromethane	5100	U
79-00-5	1,1,2-Trichloroethane	5100	U
71-43-2	Benzene	5100	U
10061-02-6	trans-1,3-Dichloropropene	5100	U
75-25-2	Bromoform	5100	U
108-10-1	4-Methyl-2-Pentanone	5100	U
591-78-6	2-Hexanone	5100	U
127-18-4	Tetrachloroethene	5100	U
79-34-5	1,1,2,2-Tetrachloroethane	5100	U
108-88-3	Toluene	5100	U
108-90-7	Chlorobenzene	5100	U
100-41-4	Ethylbenzene	5100	U
100-42-5	Styrene	5100	U
1330-20-7	Xylene (total)	5100	U

000094
EPA SAMPLE NO.

B09DR0

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M06

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 5 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.2

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKANE	17.28	5800	J
2.	UNKNOWN HYDROCARBON	18.12	6300	J
3.	UNKNOWN HYDROCARBON	18.23	14000	J
4.	UNKNOWN HYDROCARBON	18.43	5800	J
5.	UNKNOWN HYDROCARBON	18.68	5300	J
6.	UNKNOWN ALKANE	19.05	54000	J
7.	UNKNOWN CYCLOALKANE	19.17	7900	J
8.	UNKNOWN HYDROCARBON	19.43	12000	J
9.	UNKNOWN HYDROCARBON	19.62	6800	J
10.	UNKNOWN HYDROCARBON	20.60	42000	J

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000095

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	BJ
67-64-1	Acetone	8	BJ
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

EPA SAMPLE NO.

B09DR1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.78	5	BJN

9213517.1025

000097

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R05

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 0 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	2	J
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9213517.1026

000098

EPA SAMPLE NO.

B09DR2

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R05

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 0 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.75	7	BJN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31224R08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	18	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9213517.1028

000100

~~000100~~ SF 2/23/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31224R08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	12.87	6	J

9713517.1029

000101

EPA SAMPLE NO.

B09DQ7

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01D

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40119S06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	810	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	810	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01D

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40119S06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	810	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	77	BJ
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	810	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	110	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

000103
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01D

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40119S06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.75	15000	BJNA
2.	UNKNOWN HYDROCARBON	5.97	270	BJ
3.	UNKNOWN HYDROCARBON	6.43	200	BJ
4.	UNKNOWN HYDROCARBON	6.53	67	J
5.	UNKNOWN HYDROCARBON	6.90	67	BJ
6.	UNKNOWN HYDROCARBON	7.05	4100	BJ
7.	UNKNOWN HYDROCARBON	7.37	570	J
8.	UNKNOWN HYDROCARBON	7.55	67	J
9.	UNKNOWN HYDROCARBON	8.38	610	BJ
10.	HEXANEDIOIC ACID ESTER	25.95	200	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S03

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	29000	U
111-44-4	bis(2-Chloroethyl)Ether	29000	U
95-57-8	2-Chlorophenol	29000	U
541-73-1	1,3-Dichlorobenzene	29000	U
106-46-7	1,4-Dichlorobenzene	29000	U
95-50-1	1,2-Dichlorobenzene	29000	U
95-48-7	2-Methylphenol	29000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	29000	U
106-44-5	4-Methylphenol	29000	U
621-64-7	N-Nitroso-Di-n-Propylamine	29000	U
67-72-1	Hexachloroethane	29000	U
98-95-3	Nitrobenzene	29000	U
78-59-1	Isophorone	29000	U
88-75-5	2-Nitrophenol	29000	U
105-67-9	2,4-Dimethylphenol	29000	U
111-91-1	bis(2-Chloroethoxy)Methane	29000	U
120-83-2	2,4-Dichlorophenol	29000	U
120-82-1	1,2,4-Trichlorobenzene	29000	U
91-20-3	Naphthalene	29000	U
106-47-8	4-Chloroaniline	29000	U
87-68-3	Hexachlorobutadiene	29000	U
59-50-7	4-Chloro-3-Methylphenol	29000	U
91-57-6	2-Methylnaphthalene	29000	U
77-47-4	Hexachlorocyclopentadiene	29000	U
88-06-2	2,4,6-Trichlorophenol	29000	U
95-95-4	2,4,5-Trichlorophenol	71000	U
91-58-7	2-Chloronaphthalene	29000	U
88-74-4	2-Nitroaniline	71000	U
131-11-3	Dimethylphthalate	29000	U
208-96-8	Acenaphthylene	29000	U
99-09-2	3-Nitroaniline	71000	U
83-32-9	Acenaphthene	29000	U
51-28-5	2,4-Dinitrophenol	71000	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S03

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	71000	U
132-64-9	Dibenzofuran	29000	U
121-14-2	2,4-Dinitrotoluene	29000	U
606-20-2	2,6-Dinitrotoluene	29000	U
84-66-2	Diethylphthalate	29000	U
7005-72-3	4-Chlorophenyl-phenylether	29000	U
86-73-7	Fluorene	29000	U
100-01-6	4-Nitroaniline	71000	U
534-52-1	4,6-Dinitro-2-methylphenol	71000	U
86-30-6	N-Nitrosodiphenylamine (1)	29000	U
101-55-3	4-Bromophenyl-phenylether	29000	U
118-74-1	Hexachlorobenzene	29000	U
87-86-5	Pentachlorophenol	71000	U
85-01-8	Phenanthrene	29000	U
120-12-7	Anthracene	29000	U
86-74-8	Carbazole	29000	U
84-74-2	Di-n-Butylphthalate	29000	U
206-44-0	Fluoranthene	29000	U
129-00-0	Pyrene	29000	U
85-68-7	Butylbenzylphthalate	29000	U
91-94-1	3,3'-Dichlorobenzidine	29000	U
56-55-3	Benzo(a)Anthracene	29000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	29000	U
218-01-9	Chrysene	29000	U
117-84-0	Di-n-Octyl Phthalate	29000	U
205-99-2	Benzo(b)Fluoranthene	29000	U
207-08-9	Benzo(k)Fluoranthene	29000	U
50-32-8	Benzo(a)Pyrene	29000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	29000	U
53-70-3	Dibenz(a,h)Anthracene	29000	U
191-24-2	Benzo(g,h,i)Perylene	29000	U

(1) - Cannot be separated from Diphenylamine

9213517.1034

000106

EPA SAMPLE NO.

B09DQ8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S03

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 8.1

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	11.17	120000	J
2.	UNKNOWN HYDROCARBON	11.52	110000	J
3.	UNKNOWN ALKANE	12.12	750000	J
4.	UNKNOWN ALKANE	12.32	570000	J
5.	UNKNOWN HYDROCARBON	12.63	120000	J
6.	UNKNOWN CYCLIC HYDROCARBON	12.88	240000	J
7.	UNKNOWN ALKENE	13.03	120000	J
8.	UNKNOWN HYDROCARBON	13.13	140000	J
9.	UNKNOWN ALKANE	13.25	840000	J
10.	UNKNOWN ALKENE	13.50	97000	J
11.	UNKNOWN ALKANE	13.72	980000	J
12.	UNKNOWN HYDROCARBON	13.83	130000	J
13.	UNKNOWN ALKANE	13.93	170000	J
14.	UNKNOWN HYDROCARBON	14.47	260000	J
15.	UNKNOWN ALKANE	14.63	140000	J
16.	UNKNOWN ALKANE	14.82	880000	J
17.	UNKNOWN ALKANE	15.18	1100000	J
18.	UNKNOWN ALKANE	16.02	620000	J
19.	UNKNOWN ALKANE	16.57	510000	J
20. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	18.43	1500000	JN

9213517.1035

000107

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40119S07

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	810	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	810	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40119S07

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	810	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	81	BJ
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	810	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	210	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

9213517.1037

000109

EPA SAMPLE NO.

B09DQ9

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40119S07

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.75	14000	BJNA
2.	UNKNOWN ALKANE	10.48	23000	J
3.	UNKNOWN HYDROCARBON	10.93	3700	J
4.	UNKNOWN HYDROCARBON	11.22	4800	J
5.	UNKNOWN ALKANE	11.38	4300	J
6.	UNKNOWN ALKANE	12.22	29000	J
7.	UNKNOWN ALKANE	12.42	21000	J
8.	UNKNOWN CYCLIC HYDROCARBON	12.95	9300	J
9.	UNKNOWN HYDROCARBON	13.12	4400	J
10.	UNKNOWN ALKANE	13.22	5500	J
11.	UNKNOWN ALKANE	13.35	24000	J
12.	UNKNOWN ALKANE	13.82	32000	J
13.	UNKNOWN ALKANE	14.02	6200	J
14.	UNKNOWN CYCLIC HYDROCARBON	14.55	12000	J
15.	UNKNOWN ALKANE	14.72	7700	J
16.	UNKNOWN ALKANE	15.28	39000	J
17.	UNKNOWN ALKANE	16.08	23000	J
18.	UNKNOWN ALKANE	16.63	22000	J
19.	UNKNOWN ALKANE	17.90	5500	J
20. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	18.62	130000	JN

9213517.1038

000110

EPA SAMPLE NO.

B09DR0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04B

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120S08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 8.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	6800	U
111-44-4	bis(2-Chloroethyl)Ether	6800	U
95-57-8	2-Chlorophenol	6800	U
541-73-1	1,3-Dichlorobenzene	6800	U
106-46-7	1,4-Dichlorobenzene	6800	U
95-50-1	1,2-Dichlorobenzene	6800	U
95-48-7	2-Methylphenol	6800	U
108-60-1	2,2'-oxybis(1-Chloropropane)	6800	U
106-44-5	4-Methylphenol	6800	U
621-64-7	N-Nitroso-Di-n-Propylamine	6800	U
67-72-1	Hexachloroethane	6800	U
98-95-3	Nitrobenzene	6800	U
78-59-1	Isophorone	6800	U
88-75-5	2-Nitrophenol	6800	U
105-67-9	2,4-Dimethylphenol	6800	U
111-91-1	bis(2-Chloroethoxy)Methane	6800	U
120-83-2	2,4-Dichlorophenol	6800	U
120-82-1	1,2,4-Trichlorobenzene	6800	U
91-20-3	Naphthalene	6800	U
106-47-8	4-Chloroaniline	6800	U
87-68-3	Hexachlorobutadiene	6800	U
59-50-7	4-Chloro-3-Methylphenol	6800	U
91-57-6	2-Methylnaphthalene	6800	U
77-47-4	Hexachlorocyclopentadiene	6800	U
88-06-2	2,4,6-Trichlorophenol	6800	U
95-95-4	2,4,5-Trichlorophenol	16000	U
91-58-7	2-Chloronaphthalene	6800	U
88-74-4	2-Nitroaniline	16000	U
131-11-3	Dimethylphthalate	6800	U
208-96-8	Acenaphthylene	6800	U
99-09-2	3-Nitroaniline	16000	U
83-32-9	Acenaphthene	6800	U
51-28-5	2,4-Dinitrophenol	16000	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04B

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120S08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 8.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	16000	U
132-64-9	Dibenzofuran	6800	U
121-14-2	2,4-Dinitrotoluene	6800	U
606-20-2	2,6-Dinitrotoluene	6800	U
84-66-2	Diethylphthalate	6800	U
7005-72-3	4-Chlorophenyl-phenylether	6800	U
86-73-7	Fluorene	6800	U
100-01-6	4-Nitroaniline	16000	U
534-52-1	4,6-Dinitro-2-methylphenol	16000	U
86-30-6	N-Nitrosodiphenylamine (1)	6800	U
101-55-3	4-Bromophenyl-phenylether	6800	U
118-74-1	Hexachlorobenzene	6800	U
87-86-5	Pentachlorophenol	16000	U
85-01-8	Phenanthrene	6800	U
120-12-7	Anthracene	6800	U
86-74-8	Carbazole	6800	U
84-74-2	Di-n-Butylphthalate	6800	U
206-44-0	Fluoranthene	6800	U
129-00-0	Pyrene	6800	U
85-68-7	Butylbenzylphthalate	6800	U
91-94-1	3,3'-Dichlorobenzidine	6800	U
56-55-3	Benzo(a)Anthracene	6800	U
117-81-7	bis(2-Ethylhexyl)Phthalate	6800	U
218-01-9	Chrysene	6800	U
117-84-0	Di-n-Octyl Phthalate	6800	U
205-99-2	Benzo(b)Fluoranthene	6800	U
207-08-9	Benzo(k)Fluoranthene	6800	U
50-32-8	Benzo(a)Pyrene	6800	U
193-39-5	Indeno(1,2,3-cd)Pyrene	6800	U
53-70-3	Dibenz(a,h)Anthracene	6800	U
191-24-2	Benzo(g,h,i)Perylene	6800	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04B

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120S08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 8.0

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	10.17	61000	J
2.	UNKNOWN ALKANE	10.38	330000	J
3.	UNKNOWN HYDROCARBON	11.12	70000	J
4.	UNKNOWN ALKANE	11.28	59000	J
5.	UNKNOWN ALKANE	11.48	64000	J
6.	UNKNOWN ALKANE	11.58	44000	J
7.	UNKNOWN HYDROCARBON	11.78	30000	J
8.	UNKNOWN ALKANE	12.10	440000	J
9.	UNKNOWN ALKANE	12.30	270000	J
10.	UNKNOWN HYDROCARBON	12.60	57000	J
11.	UNKNOWN CYCLIC HYDROCARBON	12.83	150000	J
12.	UNKNOWN HYDROCARBON	13.00	69000	J
13.	UNKNOWN ALKANE	13.10	82000	J
14.	UNKNOWN ALKANE	13.25	350000	J
15.	UNKNOWN ALKANE	13.70	530000	J
16.	UNKNOWN ALKANE	13.92	98000	J
17.	UNKNOWN CYCLIC HYDROCARBON	14.45	150000	J
18.	UNKNOWN ALKANE	14.60	88000	J
19.	UNKNOWN ALKANE	15.17	530000	J
20. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	18.48	1200000	JN

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40119S10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 10.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	820	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40119S10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 10.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	78	BJ
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	140	BJ
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	110	J
218-01-9	Chrysene	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40119S10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 10.2

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.80	35000	BAJN
2.	UNKNOWN HYDROCARBON	5.98	310	BJ
3.	UNKNOWN HYDROCARBON	6.45	340	BJ
4.	UNKNOWN HYDROCARBON	6.93	100	BJ
5.	UNKNOWN HYDROCARBON	7.08	5300	BJ
6.	UNKNOWN HYDROCARBON	7.38	750	J
7.	UNKNOWN HYDROCARBON	8.40	750	J
8.	UNKNOWN ALCOHOL	8.77	1100	J
9.	UNKNOWN HYDROCARBON	10.45	100	J
10.	UNKNOWN HYDROCARBON	11.12	140	J
11.	UNKNOWN HYDROCARBON	12.00	68	BJ
12.	UNKNOWN ALKANE	13.25	68	J
13.	UNKNOWN ALKANE	13.68	200	J
14.	UNKNOWN ALKANE	15.17	200	J
15.	UNKNOWN HYDROCARBON	16.58	68	J
16. 126-78-3	PHOSPHORIC ACID TRIBUTYL EST	18.40	580	JN
17.	UNKNOWN CARBOXYLIC ACID ESTE	21.02	440	BJ
18.	HEXANEDIOIC ACID ESTER	25.95	240	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40119S09

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	800	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40119S09

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	58	BJ
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	260	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40119S09

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

Number TICs found: 21

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.77	17000	BJNA
2.	UNKNOWN HYDROCARBON	7.07	4500	BJ
3.	UNKNOWN HYDROCARBON	7.37	700	J
4.	UNKNOWN HYDROCARBON	8.38	630	BJ
5.	UNKNOWN ALCOHOL	8.77	1100	J
6.	UNKNOWN ALKANE	12.12	3400	J
7.	UNKNOWN ALKANE	12.32	1900	J
8.	UNKNOWN CYCLIC HYDROCARBON	12.88	730	J
9.	UNKNOWN ALKANE	12.93	400	J
10.	UNKNOWN ALKANE	13.13	570	J
11.	UNKNOWN ALKANE	13.25	3500	J
12.	UNKNOWN ALKANE	13.72	5900	J
13.	UNKNOWN ALKANE	13.95	800	J
14.	UNKNOWN HYDROCARBON	14.48	1200	J
15.	UNKNOWN ALKANE	14.65	800	J
16.	UNKNOWN ALKANE	14.82	4400	J
17.	UNKNOWN ALKANE	15.18	6800	J
18.	UNKNOWN ALKANE	16.02	3200	J
19.	UNKNOWN ALKANE	16.58	3000	J
20. 126-78-3	PHOSPHORIC ACID TRIBUTYL EST	18.52	63000	JN
21.	HEXANEDIOIC ACID ESTER	25.95	800	J

9713517.1047

000770

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DQ7 FRACTION 01F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/13/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DQ8 FRACTION 02F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/13/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	8800	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.1049

000777

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DQ9 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/14/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	6400	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.1050

000781

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DR0 FRACTION 04F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/14/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	3500	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DR1 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/15/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.1052

000788

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample

SAMPLE ID B09DR3 FRACTION 05E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/15/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	43	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.1053

 Skinner&Sherman REPORT Work Order # S3-12-193

Received: 12/21/93 02/02/94 09:12:53

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 7
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N3-12-059
TAKEN By Client
TRANS Fedex
TYPE 6 soils
P.O. # N3-12-059
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B09DR0
02 B09DR1
03 B09DR3
04 B09DQ7
05 B09DQ8
06 B09DQ9
06 B09DQ9D
06 B09DQ9S
07 LCSS

TEST CODES and NAMES used on this workorder

NITR S Nitrate/Nitrite in Soils

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.
300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.1054

Received: 12/21/93 Results by Sample

SAMPLE ID B09DR0 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/14/93 Category SOIL

NITR_S 128
mg N/kg

SAMPLE ID B09DR1 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/15/93 Category SOIL

NITR_S 6.14
mg N/kg

SAMPLE ID B09DR3 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/14/93 Category SOIL

NITR_S 64.9
mg N/kg

SAMPLE ID B09DQ7 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 12/13/93 Category SOIL

NITR_S 3.97
mg N/kg

SAMPLE ID B09DQ8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 12/13/93 Category SOIL

NITR_S 261
mg N/kg

SAMPLE ID B09DQ9 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 12/12/14 Category SOIL

NITR_S 56.8
mg N/kg

SAMPLE ID B09DQ9D SAMPLE # 06 FRACTIONS: B
Date & Time Collected 12/12/14 Category SOIL

NITR_S 59.5
mg N/kg

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97:3517.1055

Received: 12/21/93 Results by Sample

SAMPLE ID B09D09S SAMPLE # 06 FRACTIONS: C

Date & Time Collected 12/12/14 Category SOIL

NITR_S 81.9
mg N/kg

SAMPLE ID LCSS SAMPLE # 07 FRACTIONS: A

Date & Time Collected not specified Category SOIL

NITR_S 2.04
mg N/L

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9713517.1056

Received: 12/21/93 02/02/94 09:12:53

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S312193-01	56.8 mg/kg	19.8 mg/kg	81.9 mg/kg	126.8

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S312193-01	56.8 mg/kg	59.9 mg/kg	4.6

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.04 mg/L	102.0
Prep blank	--	<0.25 mg/L	--

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Received: 12/21/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

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1-800-4 LAB TEST FAX (617) 890-3883

973517 1058

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 53-12-193 Client Lockheed Martin Number/Type of Samples 6 soil
Protocol CLP Turnaround Cooler Temp: _____ °C, or N/A Cooler Yes/No
Custodian: D. Martinez Shipper & # Fedex SDG/Batch# _____
Custody Seal: Present/Absent/Intact/Not Client Case# W3-12-059
Purchase Order/Contract# _____ Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,# _____

Sample Containers - Intact/Broken Comment: _____
Client Comment? Yes/No _____
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/2/93 _____ _____ _____ _____ _____ _____
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09DP0	Soil	12/2/93	NA	NO3 NO2	
2	B09DP1	↓	↓	↓	↓	
3	B09DP3	↓	↓	↓	↓	
4	B09DQ7	↓	↓	↓	↓	
5	B09DQ8	↓	↓	↓	↓	
6	B09DQ9	↓	↓	↓	↓ D.S	
7						
8						
9						
10						
11						
12					Complete	
13						
14						
15					D.Bm 12/21/93	
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No ____
These samples have detectable amounts of Radioactive Material: Yes ____ No ✓

Subcontract: Yes/No, To: _____ Date: _____

Reviewed _____ Date _____

* EPA/CLP required

Rev 1.7

9713517.1059

TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-059

RCVD: 12/20/93 DUE: 01/24/94 12/20/93 14:42:25 KEEP: 01/24/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B09DR0	S&S	WH001	WH002	WH004	WH005	WH233	WH390
02B-S	B09DR1	S&S	WH001	WH002	WH004	WH005	WH233	WH390
03B-S	B09DR3	S&S	WH001	WH002	WH004	WH005	WH233	WH390
04B-S	B09DG7	S&S	WH001	WH002	WH004	WH005	WH233	WH390
05B-S	B09DG8	S&S	WH001	WH002	WH004	WH005	WH233	WH390
06B-S	B09DG9	S&S	WH001	WH002	WH004	WH005	WH233	WH390
06F-S	B09DG9 MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
06G-S	B09DG9 DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
06H-S	L C S	S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Iyamamoto	12-20-93	Skixxer	12-20-93	D. Martinez	12/21/93

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9413517.1060

FEB 1994
RECEIVED
SDLA

RECORD COPY

January 24, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Six (6) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 21, 1993 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S312192.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The digestion spike recoveries for manganese exceeded control limit requirements.

The ICP serial dilution exceeded the control limit requirements for calcium and potassium.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

i.
DSa
4-7-95

9213517.1061

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B09DQ7

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-04S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4800			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	2.6			P
7440-39-3	Barium	55.6			P
7440-41-7	Beryllium	0.12	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	9730		E	P
7440-47-3	Chromium	7.1			P
7440-48-4	Cobalt	5.2	B		P
7440-50-8	Copper	8.8			P
7439-89-6	Iron	11900			P
7439-92-1	Lead	3.3			P
7439-95-4	Magnesium	4050			P
7439-96-5	Manganese	223		N	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.1	B		P
7440-09-7	Potassium	994	B	E	P
7782-49-2	Selenium	0.57	U		P
7440-22-4	Silver	0.85	B		P
7440-23-5	Sodium	1070			P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	24.6			P
7440-66-6	Zinc	25.4			P
	Cyanide	0.48	U		CA
7440-32-6	Titanium	776			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DQ8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-05S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 88.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10700			P
7440-36-0	Antimony	2.7	U		P
7440-38-2	Arsenic	4.8			P
7440-39-3	Barium	43.3	B		P
7440-41-7	Beryllium	0.83	B		P
7440-43-9	Cadmium	0.38	U		P
7440-70-2	Calcium	10700		E	P
7440-47-3	Chromium	12.5			P
7440-48-4	Cobalt	15.7			P
7440-50-8	Copper	15.1			P
7439-89-6	Iron	23100			P
7439-92-1	Lead	5.1			P
7439-95-4	Magnesium	5270			P
7439-96-5	Manganese	234		N	P
7439-97-6	Mercury	2.1			CV
7440-02-0	Nickel	17.6			P
7440-09-7	Potassium	1400		E	P
7782-49-2	Selenium	0.63	U		P
7440-22-4	Silver	1.5	B		P
7440-23-5	Sodium	172	B		P
7440-28-0	Thallium	0.84	B		P
7440-62-2	Vanadium	53.7			P
7440-66-6	Zinc	56.7			P
	Cyanide	0.56	U		CA
7440-32-6	Titanium	1500			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DQ9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-06S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 97.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5430			P
7440-36-0	Antimony	2.4	U		P
7440-38-2	Arsenic	3.1			P
7440-39-3	Barium	61.8			P
7440-41-7	Beryllium	0.15	B		P
7440-43-9	Cadmium	0.33	U		P
7440-70-2	Calcium	8240		E	P
7440-47-3	Chromium	8.7			P
7440-48-4	Cobalt	7.1	B		P
7440-50-8	Copper	9.4			P
7439-89-6	Iron	13700			P
7439-92-1	Lead	2.4			P
7439-95-4	Magnesium	3600			P
7439-96-5	Manganese	267		N	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	7.6	B		P
7440-09-7	Potassium	862	B	E	P
7782-49-2	Selenium	0.55	U		P
7440-22-4	Silver	1.1	B		P
7440-23-5	Sodium	150	B		P
7440-28-0	Thallium	0.73	U		P
7440-62-2	Vanadium	37.1			P
7440-66-6	Zinc	28.7			P
	Cyanide	0.48	U		CA
7440-32-6	Titanium	1150			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DR0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-01S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6930			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	5.6			P
7440-39-3	Barium	52.9			P
7440-41-7	Beryllium	0.26	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	12500		E	P
7440-47-3	Chromium	10.1			P
7440-48-4	Cobalt	6.7	B		P
7440-50-8	Copper	11.6			P
7439-89-6	Iron	13300			P
7439-92-1	Lead	6.7			P
7439-95-4	Magnesium	5410			P
7439-96-5	Manganese	239		N	P
7439-97-6	Mercury	0.35			CV
7440-02-0	Nickel	8.9			P
7440-09-7	Potassium	1610		E	P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	0.74	B		P
7440-23-5	Sodium	89.7	B		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	24.7			P
7440-66-6	Zinc	36.7			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	664			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

9213517.1065

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DR1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-02S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 96.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4860			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	2.1			P
7440-39-3	Barium	49.8			P
7440-41-7	Beryllium	0.14	B		P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	9260		E	P
7440-47-3	Chromium	7.3			P
7440-48-4	Cobalt	5.6	B		P
7440-50-8	Copper	8.7			P
7439-89-6	Iron	12400			P
7439-92-1	Lead	2.6			P
7439-95-4	Magnesium	4240			P
7439-96-5	Manganese	210		N	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	7.8	B		P
7440-09-7	Potassium	908	B	E	P
7782-49-2	Selenium	0.57	U		P
7440-22-4	Silver	0.63	B		P
7440-23-5	Sodium	939	B		P
7440-28-0	Thallium	0.95	B		P
7440-62-2	Vanadium	28.3			P
7440-66-6	Zinc	25.9			P
	Cyanide	0.47	U		CA
7440-32-6	Titanium	859			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DR3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-03S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5120			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	4.1			P
7440-39-3	Barium	37.1	B		P
7440-41-7	Beryllium	0.15	B		P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	9110		E	P
7440-47-3	Chromium	8.8			P
7440-48-4	Cobalt	5.3	B		P
7440-50-8	Copper	8.7			P
7439-89-6	Iron	11700			P
7439-92-1	Lead	3.6			P
7439-95-4	Magnesium	4220			P
7439-96-5	Manganese	251		N	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.7			P
7440-09-7	Potassium	918	B	E	P
7782-49-2	Selenium	0.57	U		P
7440-22-4	Silver	1.0	B		P
7440-23-5	Sodium	102	B		P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	21.9			P
7440-66-6	Zinc	26.7			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	608			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

9213517.1067

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 53-12-92 Client Hanford WOC Number/Type of Samples 6 Soils
Protocol CLP Turnaround 33 days Cooler Temp: 11 °C, or N/A Cooler Yes/No
Custodian: D Mauriceau Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# N3-12-059
Purchase Order/Contract# Client Contact D. Sandney
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/21/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09DB0	Soil	12/21/93	NA	Tmetals + Ti, CN	
2	B09DB1					
3	B09DB3					
4	B09DB7					
5	B09DC8					
6	B09DD9	↓	↓	↓	↓ (D.S)	
7						
8						
9						
10		Complete				
11						
12						
13						
14			DRM	12/21/93		
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes ✓ No

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

9213517.1068

RECORD COPY

FEB 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS & GENERAL CHEMISTRY
Case No. 12-051
(TMA/ARLI W.O. No. A3-12-051)

METALS & NITRATE/NITRITE
Case No. N3-12-063
(TMA/Skinner & Sherman W.O. Nos. S3-12-226 & S3-12-229)

February 23, 1994

FEB 1994
RECEIVED
SDLA

TMA Master Work Order N3-12-063

9713517.1069

TMA/Norcal CHAIN OF CUSTODY ORD # N3-12-063 000002

RCVD: 12/22/93 DUE: 01/26/94 12/23/93 08:28:41 KEEP: 01/26/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09DR4	ARLI	WH014	WH016	WH195	WH232
01C-S	B09DR4 MS	ARLI	WH014	WH016	WH195	WH232
01D-S	B09DR4 MSD	ARLI	WH014	WH016	WH195	
01E-S	B09DR4 DUP	ARLI	WH232			
02A-S	B09DR5	ARLI	WH014	WH016	WH195	WH232
03A-S	B09DR6	ARLI	WH014	WH016	WH195	WH232

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yyamamoto	12-22-93	ARLI	12-22-93	P.S	12/23/93

9213517.1070

0000024

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8217 — Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) BC9DR4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 Florence Rogers 0845	A.V. Selyer	12.21.93 0846
Relinquished by: A.V. Selyer	Received by: Francis	Date/Time: 12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1071

000002B

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS LE Rogers S.A.F. # 93-263 Date

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
BC9DR4	S	12/16/93	0912 hrs	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79 WJS 12·21·93
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample					
	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE OBSERVED

A-6000-406 (06/91) WEF060

9213517.1072

C000002C

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Fanh

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12/16/93

Ice Chest No.: SML-410

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1)

B09DR5

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/16/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Loren Rogers 12-21-93	Genis	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713512.1073

000002D

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS / J.D. Fambrel S.A.F. # 93-263 Date 12/16/93

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B01DR5	S	12/16/93	1109	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125mL G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79 12/16/93
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml GW:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

***Type of Sample**

A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information **TMA**

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards up to 250 cpm. RADIOACTIVE

A-6000-406 (06/91) WEF060

9213517.1074

000002E

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-20-93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217

Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

HER 12-20-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845	W.V. Setzer	12-21-93 0846
W.V. Setzer	[illegible]	12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1075

000002F

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 12-20-93

Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DR6	S	12-20-93	1330	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
				1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

KCR 12-20-93

*Type of Sample	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

9213517.1076

000003

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARLI

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): Payam Shadi

LOG-IN-DATE : 12/23/93

RECEIVED BY (SIGNATURE): PAYAM SHADI

ICE CHEST NO. SML 410

REMARKS:

1. Custody Seal(s) — Present / Absent* — Intact / Broken
2. Custody Seal Nos: _____
3. Chain of Custody Records — Present / Absent*
4. Traffic Reports or Packing List — Present / Absent*
5. Airbill — Airbill / Sticker Present / Absent*
6. Airbill No.: 9289158446
7. Sample Tags — Present / Absent*
8. Sample Tag Numbers — Listed / Not Listed on Chain of Custody
9. Sample Condition: — Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? — Yes / No*
11. Date Recieved at Lab: 12/23/93
12. Temp of ice chest 5 °C
13. Time Recieved: 9:30

SAMPLE TRANSFER

Fraction: _____

Area #: _____

By: _____

On: _____

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	B09DR4	A312051	
	B09DR6		
	B09DR5		

Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

FORM DC-1

000004

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289158446

7289158446

RECIPIENT'S COPY

1 Date 12-22-93

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (310-825-2633)

Company:

Department/Floor No.:

Street Address:

City:

State:

ZIP Required:

2 To (Recipient's Name) Please Print: CAROLE HARRIS

Recipient's Phone Number (Very Important): (818) 257-3247

Company: TMA/AKLI

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 166 TAYLOR

City: MONROVIA

State: CA.

ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here

Street Address:

City:

State:

ZIP Required:

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
- 11 [X] OTHER PACKAGING
- 16 [ ] FEDEX LETTER*
- 12 [ ] FEDEX PAK*
- 13 [ ] FEDEX BOX
- 14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
- 51 [ ] OTHER PACKAGING
- 56 [ ] FEDEX LETTER*
- 52 [ ] FEDEX PAK*
- 53 [ ] FEDEX BOX
- 54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
- 30 [ ] ECONOMY*

* Economy Letter rate not available. Minimum charge: One pound economy rate.

Government Overnight (Restricted for authorized users only)
- 46 [ ] GOVT LETTER
- 41 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
- 70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
- 80 [ ] TWO-DAY FREIGHT**

† Delivery commitment may be later in some areas

*Declared Value Limit $500.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 [ ] HOLD FOR PICK-UP (Fill in Box H)
- 2 [X] DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
- 4 [ ] DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
  Dry Ice: UN 1845 ___ x ___ kg 904 III
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 [ ] SATURDAY PICK-UP (Extra charge)
- 10 [ ]
- 12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	78	
	62	
Total	Total 140	Total

DIM SHIPMENT (Chargeable Weight) [ ] lbs.

L x W x H

Received At: [X] Regular Stop [ ] Drop Box [ ] DSC [ ] Station [ ] On Call Stop

Emp. No.: Date:

[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address:

City: State: Zip:

Received By: X

Date/Time Received: FedEx Employee Number:

7 Release Signature:

Federal Express Use
- Base Charges
- Declared Value Charge
- Other 1
- Other 2
- Total Charges

REVISION DATE 11/92, PART #137204 FXEM 3/93 FORMAT #155

155

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000005

MULTIPLE PACKAGE SHIPMENT LABELS

SHIPMENT DATE	12.22.93
MASTER AIRBILL NUMBER	7289115446

2 OF 2 — 8630656352

DESCRIPTION

OF — 8630656361

DESCRIPTION

OF — 8630656377

DESCRIPTION

OF — 8630656386

DESCRIPTION

OF — 8630656395

DESCRIPTION

TERMS AND CONDITIONS

DEFINITIONS

On this Airbill, we, our and us refer to Federal Express Corporation, its employees and agents. You and your refer to the sender, its employees and agents.

AGREEMENT TO TERMS

By giving us your package to deliver, you agree to all the terms on this Airbill and in our current Service Guide, which is available on request. If there is a conflict between the current Service Guide and this Airbill, the Service Guide will control. No one is authorized to alter, or modify the terms of our Agreement.

RESPONSIBILITY FOR PACKAGING AND COMPLETING AIRBILL

You are responsible for adequately packaging your goods and for properly filling out this Airbill. Omission of the number of packages and weight per package from this Airbill will result in a billing based on our best estimate of the number of packages received from you and an estimated "default" weight per package, as determined and periodically adjusted by us.

AIR TRANSPORTATION TAX INCLUDED

Our basic rate includes a federal tax required by Internal Revenue Code Section 4271 on the air transportation portion of this service.

LIMITATIONS ON OUR LIABILITY AND LIABILITIES NOT ASSUMED

Our liability for loss or damage to your package is limited to your actual damages or $100, whichever is less, unless you pay for and declare a higher authorized value. We do not provide cargo liability insurance, but you may pay an additional charge for each additional $100 of declared value. If you declare a higher value and pay the additional charge, our liability will be the lesser of your declared value or the actual value of your package.

In any event we will not be liable for any damages, whether direct, incidental, special or consequential in excess of the declared value of a shipment, whether or not Federal Express had knowledge that such damages might be incurred including, but not limited to, loss of income or profits.

We won't be liable for your acts or omissions, including but not limited to improper or insufficient packing, securing, marking or addressing, or for the acts or omissions of the recipient or anyone else with an interest in the package. Also, we won't be liable if you or the recipient violates any of the terms of our agreement. We won't be liable for loss of or damage to shipments of prohibited items.

We won't be liable for loss, damage or delay caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions, acts of public enemies, war, strikes, civil commotions, or acts or omissions of public authorities (including customs and quarantine officials) with actual or apparent authority.

DECLARED VALUE LIMITS

The highest declared value we allow for FedEx Letter and FedEx Pak shipments is $500. For other shipments, the highest declared value we allow is $25,000 unless your package contains items of extraordinary value, in which case the highest declared value we allow is $500. Items of "extraordinary value" include artwork, jewelry, furs, precious metals, negotiable instruments, and other items listed in our current Service Guide.

If you send more than one package on this Airbill, you may fill in the total declared value for all packages, not to exceed the $100, $500 or $25,000 per package limits described above. (Examples: 5 packages can have a total declared value of up to $125,000.)

If more than one package is shipped on this Airbill, our liability for loss or damage will be limited to the actual value of the package(s) lost or damaged (not to exceed the lesser of the total declared value or the per package limits described above). You have the responsibility of proving the actual loss or damage.

FILING A CLAIM

ALL CLAIMS MUST BE MADE BY YOU IN WRITING. You must notify us of your claim within strict time limits. See current Service Guide.

We'll consider your claim filed if you call and notify our Customer Service Department at 800-238-5355 and notify us in writing as soon as possible.

Within 90 days after you notify us of your claim, you must send us all relevant information about it. We are not obligated to act on any claim until you have paid all transportation charges, and you may not deduct the amount of your claim from those charges.

If the recipient accepts your package without noting any damage on the delivery record, we will assume that the package was delivered in good condition. In order for us to process your claim, you must, to the extent possible, make the original shipping cartons and packing available for inspection.

RIGHT TO INSPECT

We may, at our option, open and inspect your packages prior to or after you give them back to us.

NO C.O.D. SERVICES

NO C.O.D. SERVICES ON THIS AIRBILL. If C.O.D. Service is required, please use a Federal Express C.O.D. airbill for this purpose.

RESPONSIBILITY FOR PAYMENT

Even if you give us different payment instructions, you will always be primarily responsible for all delivery costs, as well as any cost we may incur in either returning your package to you or warehousing it pending disposition.

RIGHT OF REJECTION

We reserve the right to reject a shipment at any time, when such shipment would be likely to cause damage or delay to other shipments, equipment or personnel, or if the transportation of which is prohibited by law or is in violation of any rules contained in this Airbill or our current Service Guide.

MONEY-BACK GUARANTEE

In the event of untimely delivery, Federal Express will at your request and with some limitations, refund or credit all transportation charges. See current Service Guide for further information.

Part # 137204/137205
Rev. 11/92

97457.1078

9213517.1079

TMA/ARLI
Thermo Analytical Inc.

000006

RADIATION DOSE RATE SURVEY FORM

Date 12/23/93 COMPANY TMA/NORCAL OTHER ORD # 7289158446

Surveyor's Name MARK S. McCray

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 4/26/93 Calibration Date 9/16/93

Instrument Calibration Factor 0.280 Instrument Calibration Factor 0.192

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		33.0			0				
Consistency		7,100	0.2741		4,092	0.1504			
Smears: SMR 410		42.0			7.0			None	
Reported WHC (14) samples each <50 pCi/gram									

All OK ✓ Approved MSM

Not OK Date 12/23/93

Comments: VICTOREEN 450 P Shows 5 μR/h MSM 12/23/93

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 12-051

Solid Sample #:

B09DR4 B09DR5
B09DR6

CASE NARRATIVE

In samples B09DR4, B09DR5, and B09DR6 a peak which is believed to be acetate was detected at approximately 1.1 minutes. The matrix spike on sample B09DR4 reconfirmed the position of Fluoride and the continuing presence of the unidentified peak. Since the blanks, the calibraiton verification standards and the LCS do not contain this peak, it is believed to be derived from the sample.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 2/22/94

Maureen Parrish

9713517.1081

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93 02/22/94 13:39:18

000008

REPORT TO: Westinghouse Hanford Company
345 Hills
Richland, WA 99352

ATTEN: Ms. Briana Colley

PREPARED BY: Thermo Analytical, Inc.
160 Taylor Street
Monrovia, CA 91016

ATTEN: Ms. Carole Harris
PHONE: 818-357-3247

Maureen Parrish
CERTIFIED BY

CONTACT: MKP CIH

CLIENT: WHC SAMPLES: 4
COMPANY: Westinghouse Hanford Company
FACILITY:

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

WORK ID: SAF #93-263 CLP
TAKEN: By Westinghouse Staff
TRANS: Federal Express
TYPE: Soil
P.O. #: N3-12-063-SU-AR
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	B09DR4
01	B09DR4 MS
01	B09DR4 MSD
01	B09DR4
01	B09DR4 MS
01	B09DR4
02	B09DR5
02	B09DR5 MS
02	B09DR5 MSD
02	B09DR5
02	B09DR5 Duplicate
02	B09DR5
03	B09DR6
03	B09DR6 MS
03	B09DR6 MSD
04	KBLK1229S
04	Lab Blank
04	LCS

TEST CODES and NAMES used on this workorder

8015E3	8015M (Extractable) Form 3
8015MS	EPA 8015M EXTRACT.
BLKSUM	Method Blank Summary
BNCLPS	CLP Semivol. Solid
IC_AN	Anions Extraction Solids
WCCLPS	Anions in Solids
WCLCS	Lab Control Sample Summary
WCL_S	Chloride in Solids - WH216
WCQCD	Quality Control Summary
WCQCS	Quality Control Summary
WF_S	Fluoride in Solids
WMOIST	Moisture
WPH_S	pH of Solids
WSO4_S	Sulfate (in Solids)

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR4 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/16/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.2	mg/kg	1.0
Fluoride	300.0	0.8	mg/kg	0.5
Sulfate	300.0	28	mg/kg	5

FORM I

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93 Results by Sample

SAMPLE ID B09DR5 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/16/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.4	mg/kg	1.0
Fluoride	300.0	3.0	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

FORM I

9713512.1084

000012

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR6 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/20/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.6	mg/kg	1.0
Fluoride	300.0	3.4	mg/kg	0.5
Sulfate	300.0	18	mg/kg	5

FORM I

000079

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-051

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 22, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DR4	A3-12-051-01A	V	SOIL
B09DR4 MS	A3-12-051-01B	V	SOIL
B09DR4 MSD	A3-12-051-01C	V	SOIL
B09DR4	A3-12-051-01D	SV	SOIL
B09DR4	A3-12-051-01G	K	SOIL
B09DR5	A3-12-051-02A	V	SOIL
B09DR5 MS	A3-12-051-02H	V	SOIL
B09DR5 MSD	A3-12-051-02I	V	SOIL
B09DR5	A3-12-051-02B	SV	SOIL
B09DR5 MS	A3-12-051-02C	SV	SOIL
B09DR5 MSD	A3-12-051-02D	SV	SOIL
B09DR5	A3-12-051-02G	K	SOIL
B09DR6	A3-12-051-03A	V	SOIL
B09DR6	A3-12-051-03B	SV	SOIL
B09DR6	A3-12-051-03D	K	SOIL
B09DR6 MS	A3-12-051-03E	K	SOIL
B09DR6 MSD	A3-12-051-03F	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed, with the required QC, by heated purge within the CLP SOW holding times.

The analyte Toluene was detected below the CRQL in samples B09DR4, B09DR6, and the blank, VBLK1229R. In addition, Hexane was detected as a TIC (tentatively identified compound) in samples B09DR4 and B09DR6.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed, with the required QC, within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DR5, B09DR5MS, and B09DR5MSD. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR5MS and B09DR5MSD were within the QC limits. The surrogate 1,2-Dichloroethane-d4 had a recovery above the QC limits in sample B09DR5MSD.

All of the other QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In samples B09DR4, B09DR5, B09DR6, and B09DR5MSD, Diethylphthalate, Di-n-butylphthalate, and bis(2-Ethylhexyl)phthalate were detected at concentrations less than the CRQL. Only Diethylphthalate and Di-n-butylphthalate were detected in sample B09DR5MS and in the blank, SBLK1229S2, below the CRQL.

The matrix spikes recoveries for 4-Nitrophenol were below the QC limits in samples B09DR5MS and B09DR5MSD. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

000081

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

Kerosene was detected in samples B09DR5 and B09DR6. Sample B09DR6 was spiked with Kerosene, and the matrix spike recoveries were 71% for the MS, and 57% for the MSD. The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 2/23/94
Nicole Roth
Program Manager

Maureen Parrish 2/22/94
Maureen Parrish
Project Manager

9213517.1088

000083

EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 3 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	5	BJ
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	1	BJ
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9213517.1089

000084
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 3 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.75	6	JN

9213517.1090

000085

EPA SAMPLE NO.

B09DR5

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31230M14

Level: (low/med) MED Date Received: 12/22/93

% Moisture: not dec. 4 Date Analyzed: 12/30/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1300	U
74-83-9	Bromomethane	1300	U
75-01-4	Vinyl Chloride	1300	U
75-00-3	Chloroethane	1300	U
75-09-2	Methylene Chloride	1300	U
67-64-1	Acetone	1300	U
75-15-0	Carbon Disulfide	1300	U
75-35-4	1,1-Dichloroethene	1300	U
75-34-3	1,1-Dichloroethane	1300	U
540-59-0	1,2-Dichloroethene (total)	1300	U
67-66-3	Chloroform	1300	U
107-06-2	1,2-Dichloroethane	1300	U
78-93-3	2-Butanone	1300	U
71-55-6	1,1,1-Trichloroethane	1300	U
56-23-5	Carbon Tetrachloride	1300	U
75-27-4	Bromodichloromethane	1300	U
78-87-5	1,2-Dichloropropane	1300	U
10061-01-5	cis-1,3-Dichloropropene	1300	U
79-01-6	Trichloroethene	1300	U
124-48-1	Dibromochloromethane	1300	U
79-00-5	1,1,2-Trichloroethane	1300	U
71-43-2	Benzene	1300	U
10061-02-6	trans-1,3-Dichloropropene	1300	U
75-25-2	Bromoform	1300	U
108-10-1	4-Methyl-2-Pentanone	1300	U
591-78-6	2-Hexanone	1300	U
127-18-4	Tetrachloroethene	1300	U
79-34-5	1,1,2,2-Tetrachloroethane	1300	U
108-88-3	Toluene	1300	U
108-90-7	Chlorobenzene	1300	U
100-41-4	Ethylbenzene	1300	U
100-42-5	Styrene	1300	U
1330-20-7	Xylene (total)	1300	U

9213512.1091

000086

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31230M14

Level: (low/med) MED Date Received: 12/22/93

% Moisture: not dec. 4 Date Analyzed: 12/30/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 7

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	18.23	2000	J
2.	UNKNOWN ALKANE	19.05	5900	J
3.	UNKNOWN POLYNUCLEAR AROMATIC	19.45	1800	J
4.	UNKNOWN ALKENE	19.63	780	J
5.	UNKNOWN HYDROCARBON	20.25	780	J
6.	UNKNOWN ALKANE	20.42	910	J
7.	UNKNOWN KETONE	20.62	4000	J

9213517.1092

000087
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 7 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	9	BJ
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	1	BJ
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

9213517.1093

000088

EPA SAMPLE NO.

B09DR6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 7 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.78	8	JN

9213517.1094

000089
EPA SAMPLE NO.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01D

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120I03

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	800	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01D

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120I03

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	60	BJ
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	90	BJ
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	160	J
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01D

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120I03

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

Number TICs found: 16

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.18	200	BJ
2.	UNKNOWN HYDROCARBON	5.52	170	BJ
3.	UNKNOWN HYDROCARBON	5.67	340	BJ
4.	UNKNOWN HYDROCARBON	5.77	67	BJ
5.	UNKNOWN HYDROCARBON	6.13	130	BJ
6.	UNKNOWN GLYCOL ETHER	6.25	5800	BJ
7.	UNKNOWN HYDROCARBON	6.58	500	BJ
8.	UNKNOWN HYDROCARBON	6.77	100	BJ
9.	UNKNOWN HYDROCARBON	7.52	700	BJ
10.	UNKNOWN ALKENE	7.83	67	J
11.	UNKNOWN ALCOHOL	7.90	640	J
12.	UNKNOWN HYDROCARBON	10.18	67	J
13.	UNKNOWN ALKANE	24.22	100	J
14.	HEXANEDIOIC ACID ISOMER	25.02	15000	J
15.	UNKNOWN ALKANE	25.12	130	J
16.	UNKNOWN ALKANE	26.80	67	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40120I04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	820	U

9713517.1098

000093

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40120I04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	79	BJ
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	110	BJ
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	120	J
218-01-9	Chrysene	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

9213517.1099

000094

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40120I04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN GLYCOL ETHER	6.25	6500	BJ
2.	UNKNOWN ALKANE	9.57	20000	J
3.	UNKNOWN ALKANE	10.45	4400	J
4.	UNKNOWN ALKANE	10.62	4900	J
5.	UNKNOWN ALKANE	11.23	30000	J
6.	UNKNOWN ALKANE	11.42	16000	J
7.	UNKNOWN HYDROCARBON	11.90	5700	J
8.	UNKNOWN HYDROCARBON	12.03	6900	J
9.	UNKNOWN ALKANE	12.32	23000	J
10.	UNKNOWN ALKANE	12.78	38000	J
11.	UNKNOWN ALKANE	12.88	5900	J
12.	UNKNOWN ALKANE	12.98	5200	J
13.	UNKNOWN ALCOHOL	13.47	11000	J
14.	UNKNOWN ALKANE	13.67	6600	J
15.	UNKNOWN ALKANE	13.85	25000	J
16.	UNKNOWN ALKANE	14.20	41000	J
17.	UNKNOWN ALKANE	14.98	19000	J
18.	UNKNOWN ALKANE	15.53	21000	J
19.	PHOSPHORIC ACID ESTER	17.42	98000	J
20.	HEXANEDIOIC ACID ISOMER	25.02	15000	J

9213512.1100

000095

EPA SAMPLE NO.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40120I07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	850	U

9213517.1101

000096
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40120I07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	850	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	200	BJ
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	850	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	140	BJ
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	100	J
218-01-9	Chrysene	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

9713517.1102

000097
EPA SAMPLE NO.

B09DR6

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40120I07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.18	210	BJ
2.	UNKNOWN HYDROCARBON	5.50	180	BJ
3.	UNKNOWN HYDROCARBON	5.67	350	BJ
4.	UNKNOWN HYDROCARBON	5.75	71	BJ
5.	UNKNOWN GLYCOL ETHER	6.25	5700	BJ
6.	UNKNOWN HYDROCARBON	6.57	420	BJ
7.	UNKNOWN HYDROCARBON	6.75	110	BJ
8.	UNKNOWN HYDROCARBON	7.52	740	BJ
9.	UNKNOWN HYDROCARBON	7.58	320	BJ
10.	UNKNOWN ALCOHOL	7.90	960	BJ
11.	UNKNOWN HYDROCARBON	10.08	71	J
12.	UNKNOWN HYDROCARBON	10.18	71	BJ
13.	UNKNOWN HYDROCARBON	13.20	250	J
14.	UNKNOWN HYDROCARBON	16.18	140	J
15.	PHOSPHORIC ACID ESTER	17.35	58000	J
16.	UNKNOWN ALKANE	24.22	71	J
17.	HEXANEDIOIC ACID ISOMER	25.02	18000	J
18.	UNKNOWN HYDROCARBON	25.12	71	J

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93 Results by Sample

SAMPLE ID B09DR4 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/16/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/06/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	ND	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.1104

000550

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR5 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/16/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/07/94
Dilution factor: 5.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	1026	25
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR6 FRACTION 03D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/20/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/06/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	22	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

9713517.1106

 Skinner&Sherman REPORT Work Order # S3-12-229

Received: 12/23/93 02/02/94 09:01:08

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

CLIENT HANFORD NOR SAMPLES 4
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

WORK ID N3-12-063
TAKEN By Client
TRANS Fedex
TYPE 3 soils
P.O. # N3-12-063
INVOICE under separate cover

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 B09DR4	NITR S Nitrate/Nitrite in Soils
02 B09DR5	
03 B09DR6	
03 B09DR6D	
03 B09DR6S	
04 LCSS	

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713517.1107

 Skinner&Sherman REPORT Work Order # S3-12-229

Received: 12/23/93 Results by Sample

SAMPLE ID B09DR4 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/16/93 Category SOIL

NITR_S 14.3
mg N/kg

SAMPLE ID B09DR5 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/16/93 Category SOIL

NITR_S 33.1
mg N/kg

SAMPLE ID B09DR6 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/16/93 Category SOIL

NITR_S <2.50
mg N/kg

SAMPLE ID B09DR6D SAMPLE # 03 FRACTIONS: B
Date & Time Collected 12/16/93 Category SOIL

NITR_S <2.50
mg N/kg

SAMPLE ID B09DR6S SAMPLE # 03 FRACTIONS: C
Date & Time Collected 12/16/93 Category SOIL

NITR_S 20.8
mg N/kg

SAMPLE ID LCSS SAMPLE # 04 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

TMA
Thermo Analytical Inc.

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9713517.1108

 Skinner&Sherman REPORT Work Order # S3-12-229

Received: 12/23/93 02/02/94 09:01:08

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S311229-03	<2.50 mg/kg	19.9 mg/kg	20.8 mg/kg	104.5

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S311229-03	<2.50 mg/kg	<2.50 mg/kg	not calculable

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.07 mg/L	103.5
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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9713517.1109

Received: 12/23/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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1-800-4 LAB TEST FAX (617) 890-3883

9713517.1110

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 93-12-229 Client Hanford Number/Type of Samples 3 Soils
Protocol CLP Turnaround 33 days Cooler Temp: 4 °C, or N/A Cooler Yes/No
Custodian: D. Martinez Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# W3-12-063
Purchase Order/Contract# Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/23/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B9DB4	soil	12/23/93	NA	~~Anions~~ NO3NO2	
2	B9DR5	↓	↓	↓	↓	
3	B9DR6	↓	↓	↓	↓ 0,5	
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Complete
DPM 12/23/93

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes ✓ No

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

 9213512-1111 TMA/NorCal CHAIN OF CUSTODY ORD # N3-12-063

RCVD: 12/22/93 DUE: 01/26/94 12/23/93 08:28:49 KEEP: 01/26/95 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B09DR4	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	B09DR4 MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	B09DR4 DUP	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01H-S	L C S	S&S	WH001	WH002	WH004	WH005	WH233	WH390
02B-S	B09DR5	S&S	WH001	WH002	WH004	WH005	WH233	WH390
03B-S	B09DR6	S&S	WH001	WH002	WH004	WH005	WH233	WH390

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	12-22-93	Skinner	12-22-93	D. Maximum	12/28/93

9713517.1112

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

FEB 1994
RECEIVED
SDLA

RECORD COPY

January 25, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Three (3) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 23, 1993 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S312226.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The digestion spike recovery for antimony exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

i DEa 4-7-95

9213517.1113

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DR4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Lab Sample ID: 12226-01S

Level (low/med): LOW Date Received: 12/23/93

% Solids: 96.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4960			P
7440-36-0	Antimony	3.1	B	N	P
7440-38-2	Arsenic	2.4			P
7440-39-3	Barium	61.0			P
7440-41-7	Beryllium	0.33	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	10800			P
7440-47-3	Chromium	7.9			P
7440-48-4	Cobalt	8.2	B		P
7440-50-8	Copper	13.4			P
7439-89-6	Iron	16600			P
7439-92-1	Lead	2.5			P
7439-95-4	Magnesium	4950			P
7439-96-5	Manganese	221			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	9.5			P
7440-09-7	Potassium	785	B		P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	0.76	B		P
7440-23-5	Sodium	501	B		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	33.8			P
7440-66-6	Zinc	39.3			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1140			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

002

9713517.1114

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B09DR5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Lab Sample ID: 12226-02S

Level (low/med): LOW Date Received: 12/23/93

% Solids: 96.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7040			P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	4.8			P
7440-39-3	Barium	56.8			P
7440-41-7	Beryllium	0.35	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	10400			P
7440-47-3	Chromium	12.0			P
7440-48-4	Cobalt	7.1	B		P
7440-50-8	Copper	10.8			P
7439-89-6	Iron	1430			P
7439-92-1	Lead	4.6			P
7439-95-4	Magnesium	5030			P
7439-96-5	Manganese	251			P
7439-97-6	Mercury	0.16			CV
7440-02-0	Nickel	10.9			P
7440-09-7	Potassium	1360			P
7782-49-2	Selenium	0.57	U		P
7440-22-4	Silver	60	B		P
7440-23-5	Sodium	100	B		P
7440-28-0	Thallium	1.2	B		P
7440-62-2	Vanadium	27.9			P
7440-66-6	Zinc	34.7			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	748			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

003

9213517.1115

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DR6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Lab Sample ID: 12226-03S

Level (low/med): LOW Date Received: 12/23/93

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7660			P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	5.4			P
7440-39-3	Barium	64.2			P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	9110			P
7440-47-3	Chromium	13.6			P
7440-48-4	Cobalt	7.7	B		P
7440-50-8	Copper	12.1			P
7439-89-6	Iron	14600			P
7439-92-1	Lead	5.5			P
7439-95-4	Magnesium	5490			P
7439-96-5	Manganese	297			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	13.0			P
7440-09-7	Potassium	1730			P
7782-49-2	Selenium	0.58	U		P
7440-22-4	Silver	0.50	B		P
7440-23-5	Sodium	413	B		P
7440-28-0	Thallium	0.88	B		P
7440-62-2	Vanadium	29.7			P
7440-66-6	Zinc	37.7			P
	Cyanide	0.49	U		CA
7440-32-6	Titanium	758			P

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

004

9713517.1116

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3095M 7289158424

SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER 0941-5760-9 Date 12-22-93

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): 510-235-2633
Company: T Y A /NORCAL
Department/Floor No.
Street Address: 2030 WRIGHT AVE
City: RICHMOND State: CA ZIP Required: 94804

To (Recipient's Name) Please Print: ANTONIA
Recipient's Phone Number (Very Important): (617) 890-7200
Company: SKINNER/SHERMAN LAB.
Department/Floor No.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 300 SECOND AVENUE
City: WALTHAM State: MA ZIP Required: 02254-0521

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

PAYMENT 1 [X] Bill Sender Acct. No. Req'd. 2 [ ] Bill Recipient's FedEx Acct. No. Fill in Account number below 3 [ ] Bill 3rd Party FedEx Acct. No. Fill in Account number below (req'd.) 4 [ ] Bill Credit Card Fill in Credit Card No. below (req'd.) 5 [ ] Cash/Check
Acct./Credit Card No. Exp. Date

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
11 [X] OTHER PACKAGING
12 [ ] FEDEX LETTER*
13 [ ] FEDEX PAK*
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery on second business day)
30 [ ] ECONOMY*
* Economy Letter rate not available. Minimum charge One pound economy rate

Government Overnight (Restricted for authorized users only)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

Freight Service (For packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**
1 Delivery commitment may be later in some areas
*Declared Value Limit $500
**Call for delivery schedule

5 DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fee in Box 6)
2 [X] DELIVER WEEKDAY
3 [ ] DELIVER SATURDAY
4 [ ] DELIVERY OF GOODS
5 [ ] DRY ICE
6 [ ] Declared Value
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
10 [ ]
11 [ ] HOLIDAY DELIVERY (Extra charge)

6 PACKAGES | WEIGHT in Pounds Only: 1 | 40
Total | Total: 1 | 40
DIM SHIPMENT (Chargeable Weight) [ ] lbs. ___ X ___ X ___

Received At: [X] 1 Regular Stop [ ] 3 Drop Box [ ] 4 B.S.C. [ ] 5 Station [ ] 2 On-Call Stop

7 Release Signature:

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Dr. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 11/92
PART #137204 FXEM 3/93
FORMAT #155
155
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9713517.1117

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-12-226 Client Hanford/WOR Number/Type of Samples 3 Soil
Protocol CLP Turnaround 33 days Cooler Temp: 4 °C, or N/A Cooler Yes/No
Custodian: D. Martineau Shipper & # Fedex SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# N3-12-063
Purchase Order/Contract# N3-12-063 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 12/23/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09DR4	Soil	12/23/93	NA	CLP metals + Ti, CN	
2	B09DR5	↓	↓	↓	↓	
3	B09DR6	↓	↓	↓	↓ (D,S)	
4						
5						
6						
7						
8						
9						
10						
11						
12			Complete			
13						
14						
15			DRM 12/23/93			
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes ✓ No

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

TMA/Norcal

Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

February 18, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7304 is comprised of thirteen samples from location 200-UP-2, delivered under Chain-of-Custody document EFL-1091. One 1000 mL plastic bottle of each sample was received for analysis.

Samples B09DQ6 and B09DQ8 contained such high levels of uranium, technetium, and strontium-90 that it was necessary to analyze them separately in a lab area specifically designed to handle high level samples. All other samples were analyzed in the general environmental laboratory.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Strontium-90 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.5 Technetium-99 Analyses

Sample B09DQ2 had a low chemical yield of 18%, resulting in an MDA which exceeds the RDL. There was not enough sample to perform a reanalysis and no cause could be determined for the poor yield.

There was not enough of samples B09DQ6 and B09DQ8 to analyze nominal 2g aliquots, so 1g aliquots were taken. The MDA's exceed the RDL in each case. Sample B09DQ6 does contain positive technetium-99 activity, so the high MDA does not affect the validity of the data.

The found/added ratio for laboratory control sample 7304-17 is 83% which is just below the 3σ protocol limits of (85-115)% but within the contract limits of (80-120)%.

TMA/Norcal
Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

February 18, 1994

2.6 Iodine-129 Analyses
The found/added ratio for laboratory control sample 7304-014 is 151%, which exceeds both the 3σ protocol limits and the contract limits. No cause could be determined for the high recovery.

2.7 Total Uranium Analyses
The high uranium activity in sample B09DQ6 necessitated that a smaller than nominal aliquot be used for analysis.

The uranium MDA's of samples B09DQ7, B09DQ9, B09DR0, B09DR3, B09DR4, B09DR5, B09DQ6 and B09DQ8 are larger than the RDL. Because each of these samples contains positive uranium activity, the high MDA's do not affect the validity of the data.

2.8 Uranium-233/234, 235 and 238 Analyses
Reagent blank 7304-020 contains uranium-238 activity above the MDA, however, both the MDA and the result are well below the RDL.

The high uranium activity in sample B09DQ6 necessitated that a smaller than nominal aliquot be used for analysis. The uranium MDA's of samples B09DQ6 and B09DQ8 are larger than the RDL. Because both samples contain positive uranium activity, the high MDA's do not affect the validity of the data.

2.9 Neptunium-237 Analyses
The chemical yield of sample B09DR1 is slightly low (16%), however, the MDA meets the RDL.

2.10 Plutonium-238 and 239/240 Analyses
It is suspected that there were problems with the plutonium plating step which resulted in relatively low chemical yields throughout the analysis batch. All yields were within the (20-105)% range with the exception of B09DQ6, which was subsequently reanalyzed. Several sample MDA's are greater than the RDL because of these lower yields.

The found/added ratio for the laboratory control sample run with samples B09DQ6 and B09DQ8 is 122% which is just outside both the 3σ protocol limits of (79-121)% and the contract limits of (80-120)%.

2.11 Americium-241 and Curium-244 Analyses

Reagent blank 7304-020 contains americium-241 activity above the MDA, however, both the MDA and the result are well below the RDL.

2.12 Gamma Scan Analyses

There was not enough sample provided to analyze the nominal 750g necessary to meet MDA requirements. MDA's exceed the RDL's because of this.

9713517.1121

N312021-01

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ0

SDG 7304 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N312021-01 Client sample id B09DQ0
Dept sample id 7304-001 Location/Matrix 200-UP-2 SOLID
Received 12/08/93 Collected 12/03/93
% moisture 5.9 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	7.9	3.9	4	10	J	80A
Gross Beta	Beta	16	4.7	6	10		80B
Selenium 79	15758-45-9	-1.2	0.91	2	10	U	SE
Strontium 90	10098-97-2	0.22	0.23	0.5	1	U	Y
Technetium 99	14133-76-7	0.030	0.076	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.076	0.77	2	2	U	I
Uranium 233/234		0.58	0.16	0.09	0.3		U
Uranium 235	15117-96-1	0.024	0.047	0.09	0.3	U	U
Uranium 238		0.55	0.15	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.30	0.02	0.1	X	U_T
Neptunium 237	13994-20-2	0.019	0.019	0.01	0.2	J	NP
Plutonium 238	13981-16-3	0.008	0.011	0.02	0.05	U	PU
Plutonium 239/240		0.005	0.005	0.02	0.05	U	PU
Americium 241	14596-10-2	0.002	0.007	0.01	0.05	U	TP
Curium 244	13981-15-2	-0.002	0.004	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	14	3.3				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.6	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9213517.1122

TMA NORCAL
REPORTING GROUP 7304

N312021-01

DATA SHEET, cont

B09DQ0

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-01	Client sample id	B09DQ0
Dept sample id	7304-001	Location/Matrix	200-UP-2 SOLID
Received	12/08/93	Collected	12/03/93
% moisture	5.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.6		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	0.76	0.34				GAM
Radium 228	15262-20-1	1.2	0.71				GAM
Thorium 228	14274-82-9	0.94	0.18				GAM
Thorium 232	7440-29-1	1.2	0.71				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9213517.1123

N312021-02

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ1

SDG 7304 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N312021-02 Client sample id B09DQ1
Dept sample id 7304-002 Location/Matrix 200-UP-2 SOLID
Received 12/08/93 Collected 12/06/93
% moisture 5.9 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	8.5	3.7	3	10	J	80A
Gross Beta	Beta	10	4.4	6	10		80B
Selenium 79	15758-45-9	0.42	0.80	1	10	U	SE
Strontium 90	10098-97-2	0.057	0.19	0.5	1	U	Y
Technetium 99	14133-76-7	0.083	0.14	0.4	0.5	U	TC
Iodine 129	15046-84-1	0.41	0.90	2	2	U	I
Uranium 233/234		0.44	0.089	0.06	0.3		U
Uranium 235	15117-96-1	0.039	0.035	0.04	0.3	U	U
Uranium 238		0.43	0.082	0.04	0.3		U
Total Uranium (ug/g)	7440-61-1	1.3	0.26	0.02	0.1	X	U_T
Neptunium 237	13994-20-2	2.4	0.22	0.04	0.2		NP
Plutonium 238	13981-16-3	0	0.010	0.04	0.05	U	PU
Plutonium 239/240		0	0.010	0.04	0.05	U	PU
Americium 241	14596-10-2	0.004	0.006	0.01	0.05	U	TP
Curium 244	13981-15-2	0	0.006	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	12	3.4				GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.3	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9713517.1124

TMA NORCAL
REPORTING GROUP 7304

N312021-02

DATA SHEET, cont

B09DQ1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-02	Client sample id	B09DQ1
Dept sample id	7304-002	Location/Matrix	200-UP-2 SOLID
Received	12/08/93	Collected	12/06/93
% moisture	5.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	U		0.5		U	GAM
Radium 228	15262-20-1	0.83	0.70				GAM
Thorium 228	14274-82-9	0.81	0.25				GAM
Thorium 232	7440-29-1	0.83	0.70				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9213512.1125

N312021-07

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ2

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-07 | Client sample id B09DQ2
Dept sample id 7304-007 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/07/93
% moisture 3.6 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	5.7	3.8	4	10	J	80A
Gross Beta	Beta	14	4.2	6	10		80B
Selenium 79	15758-45-9	-0.66	1.2	2	10	U	SE
Strontium 90	10098-97-2	0.68	0.31	0.9	1	U	Y
Technetium 99	14133-76-7	0.039	0.33	1	0.5	U	TC
Iodine 129	15046-84-1	0.10	0.76	2	2	U	I
Uranium 233/234		0.77	0.11	0.05	0.3		U
Uranium 235	15117-96-1	0.024	0.024	0.03	0.3	U	U
Uranium 238		0.84	0.11	0.04	0.3		U
Total Uranium (ug/g)	7440-61-1	2.2	0.43	0.02	0.1	X	U_T
Neptunium 237	13994-20-2	0.003	0.010	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.007	0.028	0.05	0.05	U	PU
Plutonium 239/240		0.007	0.014	0.03	0.05	U	PU
Americium 241	14596-10-2	-0.001	0.005	0.01	0.05	U	TP
Curium 244	13981-15-2	0.001	0.006	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.08		U	GAM
Potassium 40	13966-00-2	11	1.3				GAM
Manganese 54	13966-31-9	U		0.06		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.07	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.08	0.05	U	GAM
Niobium 94	14681-63-1	U		0.06		U	GAM
Ruthenium 103	13968-53-1	U		0.08		U	GAM
Ruthenium 106	13967-48-1	U		0.5		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.07		U	GAM
Cesium 137	10045-97-3	U		0.06	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

N312021-07

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ2

SDG 7304
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N312021-07
Dept sample id 7304-007
Received 12/20/93
% moisture 3.6
Client sample id B09DQ2
Location/Matrix 200-UP-2 SOLID
Collected 12/07/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.09	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.49	0.15				GAM
Radium 228	15262-20-1	0.53	0.21				GAM
Thorium 228	14274-82-9	0.53	0.070				GAM
Thorium 232	7440-29-1	0.53	0.21				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

N312021-03

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ6

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-03 | Client sample id B09DQ6
Dept sample id 7304-003 | Location/Matrix 200-UP-2 SOLID
Received 12/15/93 | Collected 12/09/93
% moisture 9.4 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	2000	50	4	10		80A
Gross Beta	Beta	19000	90	7	10		80B
Selenium 79	15758-45-9	0.43	2.0	3	10	U	SE
Strontium 90	10098-97-2	8500	130	0.9	1		Y
Technetium 99	14133-76-7	350	5.6	1	0.5		TC
Iodine 129	15046-84-1	0.11	0.64	1	2	U	I
Uranium 233/234		1400	75	5	0.3		U
Uranium 235	15117-96-1	22	20	40	0.3	U	U
Uranium 238		1500	77	4	0.3		U
Total Uranium (ug/g)	7440-61-1	4300	950	2	0.1	X	U_T
Neptunium 237	13994-20-2	2.1	0.21	0.02	0.2		NP
Plutonium 238	13981-16-3	0.006	0.032	0.05	0.05	U	PU
Plutonium 239/240		1.1	0.14	0.05	0.05		PU
Americium 241	14596-10-2	1.1	0.10	0.03	0.05		TP
Curium 244	13981-15-2	0.003	0.013	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		1		U	GAM
Potassium 40	13966-00-2	13	3.7				GAM
Manganese 54	13966-31-9	U		0.7		U	GAM
Iron 59	14596-12-4	U		1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.9	0.05	U	GAM
Cobalt 60	10198-40-0	0.37	0.25		0.05		GAM
Niobium 94	14681-63-1	U		0.7		U	GAM
Ruthenium 103	13968-53-1	U		1		U	GAM
Ruthenium 106	13967-48-1	U		7		U	GAM
Tin 113	13966-06-8	U		1		U	GAM
Cesium 134	13967-70-9	U		0.9		U	GAM
Cesium 137	10045-97-3	0.90	0.65		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9213517.1128

TMA NORCAL
REPORTING GROUP 7304

N312021-03

DATA SHEET, cont

B09DQ6

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-03	Client sample id	B09DQ6
Dept sample id	7304-003	Location/Matrix	200-UP-2 SOLID
Received	12/15/93	Collected	12/09/93
% moisture	9.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		6		U	GAM
Europium 152	14683-23-9	U		2	0.1	U	GAM
Europium 154	15585-10-1	2.0	1.2		0.1		GAM
Europium 155	14391-16-3	U		4	0.1	U	GAM
Radium 226	13982-63-3	U		1		U	GAM
Radium 228	15262-20-1	U		2		U	GAM
Thorium 228	14274-82-9	U		1		U	GAM
Thorium 232	7440-29-1	U		2		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1129

N312021-08

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ7

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-08 | Client sample id B09DQ7
Dept sample id 7304-008 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/13/93
% moisture 2.6 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	5.1	3	10		80A
Gross Beta	Beta	29	5.3	6	10		80B
Selenium 79	15758-45-9	0.59	1.0	2	10	U	SE
Strontium 90	10098-97-2	0.23	0.35	1	1	U	Y
Technetium 99	14133-76-7	6.4	0.46	0.3	0.5		TC
Iodine 129	15046-84-1	-0.26	0.92	2	2	U	I
Uranium 233/234		7.6	0.52	0.08	0.3		U
Uranium 235	15117-96-1	0.54	0.10	0.04	0.3		U
Uranium 238		7.4	0.51	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	23	4.8	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.020	0.020	0.03	0.2	U	NP
Plutonium 238	13981-16-3	0.023	0.039	0.07	0.05	U	PU
Plutonium 239/240		0.006	0.013	0.03	0.05	U	PU
Americium 241	14596-10-2	0.012	0.011	0.01	0.05	J	TP
Curium 244	13981-15-2	0.007	0.008	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	13	3.0				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9413512.1130

TMA NORCAL
REPORTING GROUP 7304

N312021-08

DATA SHEET, cont

B09DQ7

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-08	Client sample id	B09DQ7
Dept sample id	7304-008	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/13/93
% moisture	2.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.5		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	0.38	0.25				GAM
Radium 228	15262-20-1	1.0	0.53				GAM
Thorium 228	14274-82-9	0.90	0.24				GAM
Thorium 232	7440-29-1	1.0	0.53				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1151

N312021-09

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ8

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-09 | Client sample id B09DQ8
Dept sample id 7304-009 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/13/93
% moisture 10.4 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	110	14	4	10		80A
Gross Beta	Beta	2100	30	6	10		80B
Selenium 79	15758-45-9	0.38	2.5	4	10	U	SE
Strontium 90	10098-97-2	130	4.0	0.8	1		Y
Technetium 99	14133-76-7	0.85	0.43	1	0.5	U	TC
Iodine 129	15046-84-1	0.51	0.80	2	2	U	I
Uranium 233/234		28	1.2	0.08	0.3		U
Uranium 235	15117-96-1	1.1	0.29	0.6	0.3		U
Uranium 238		29	1.3	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	88	18	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.035	0.029	0.05	0.2	U	NP
Plutonium 238	13981-16-3	0.015	0.040	0.07	0.05	U	PU
Plutonium 239/240		0.010	0.030	0.05	0.05	U	PU
Americium 241	14596-10-2	0.20	0.045	0.03	0.05		TP
Curium 244	13981-15-2	0.010	0.016	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		1		U	GAM
Potassium 40	13966-00-2	15	3.3				GAM
Manganese 54	13966-31-9	U		0.3		U	GAM
Iron 59	14596-12-4	U		0.9	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.4	0.05	U	GAM
Cobalt 60	10198-40-0	0.55	0.30		0.05		GAM
Niobium 94	14681-63-1	U		0.3		U	GAM
Ruthenium 103	13968-53-1	U		3		U	GAM
Ruthenium 106	13967-48-1	U		10		U	GAM
Tin 113	13966-06-8	U		3		U	GAM
Cesium 134	13967-70-9	U		0.4		U	GAM
Cesium 137	10045-97-3	1700	8.0		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9713517.1132

N312021-09

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ8

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-09	Client sample id	B09DQ8
Dept sample id	7304-009	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/13/93
% moisture	10.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		6		U	GAM
Europium 152	14683-23-9	U		6	0.1	U	GAM
Europium 154	15585-10-1	3.1	1.2		0.1		GAM
Europium 155	14391-16-3	4.5	2.2		0.1		GAM
Radium 226	13982-63-3	U		2		U	GAM
Radium 228	15262-20-1	2.1	1.3				GAM
Thorium 228	14274-82-9	U		2		U	GAM
Thorium 232	7440-29-1	2.1	1.3				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1135

N312021-10

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ9

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-10 | Client sample id B09DQ9
Dept sample id 7304-010 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/14/93
% moisture 2.6 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	8.8	3.9	3	10	J	80A
Gross Beta	Beta	160	9.2	6	10		80B
Selenium 79	15758-45-9	0.39	0.84	1	10	U	SE
Strontium 90	10098-97-2	64	3.0	0.9	1		Y
Technetium 99	14133-76-7	0.19	0.084	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.068	0.80	2	2	U	I
Uranium 233/234		4.4	0.32	0.07	0.3		U
Uranium 235	15117-96-1	0.32	0.074	0.04	0.3		U
Uranium 238		4.3	0.31	0.05	0.3		U
Total Uranium (ug/g)	7440-61-1	13	2.7	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.018	0.014	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.050	0.050	0.08	0.05	U	PU
Plutonium 239/240		-0.007	0.014	0.04	0.05	U	PU
Americium 241	14596-10-2	0.003	0.007	0.01	0.05	U	TP
Curium 244	13981-15-2	0.014	0.011	0.01	0.05	J	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	15	2.6				GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	3.4	0.32		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9713517.1134

N312021-10	TMA NORCAL REPORTING GROUP 7304 DATA SHEET, cont	B09DQ9

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-10	Client sample id	B09DQ9
Dept sample id	7304-010	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	2.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.4	0.1	U	GAM
Radium 226	13982-63-3	0.44	0.26				GAM
Radium 228	15262-20-1	0.71	0.56				GAM
Thorium 228	14274-82-9	0.60	0.23				GAM
Thorium 232	7440-29-1	0.71	0.56				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1135

N312021-04

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR0

SDG 7304
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N312021-04
Dept sample id 7304-004
Received 12/20/93
% moisture 4.9
Client sample id B09DR0
Location/Matrix 200-UP-2 SOLID
Collected 12/14/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	5.4	4	10		80A
Gross Beta	Beta	220	10	6	10		80B
Selenium 79	15758-45-9	-0.16	0.89	1	10	U	SE
Strontium 90	10098-97-2	60	2.7	0.6	1		Y
Technetium 99	14133-76-7	0.29	0.13	0.3	0.5	U	TC
Iodine 129	15046-84-1	1.0	0.80	2	2	U	I
Uranium 233/234		6.3	0.40	0.06	0.3		U
Uranium 235	15117-96-1	0.38	0.074	0.04	0.3		U
Uranium 238		6.2	0.39	0.06	0.3		U
Total Uranium (ug/g)	7440-61-1	18	3.7	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.004	0.007	0.01	0.2	U	NP
Plutonium 238	13981-16-3	0.006	0.013	0.02	0.05	U	PU
Plutonium 239/240		0	0.006	0.02	0.05	U	PU
Americium 241	14596-10-2	-0.003	0.006	0.01	0.05	U	TP
Curium 244	13981-15-2	0.001	0.003	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.3		U	GAM
Potassium 40	13966-00-2	17	3.5				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.6		U	GAM
Ruthenium 106	13967-48-1	U		3		U	GAM
Tin 113	13966-06-8	U		0.5		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	56	1.2		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

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TMA NORCAL
REPORTING GROUP 7304

N312021-04

DATA SHEET, cont

B09DR0

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-04	Client sample id	B09DR0
Dept sample id	7304-004	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	4.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.5	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.6	0.1	U	GAM
Radium 226	13982-63-3	0.61	0.58				GAM
Radium 228	15262-20-1	1.7	0.83				GAM
Thorium 228	14274-82-9	1.2	0.52				GAM
Thorium 232	7440-29-1	1.7	0.83				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1137

N312021-05

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-05	Client sample id	B09DR1
Dept sample id	7304-005	Location/Matrix	200-UP-1 SOLID
Received	12/20/93	Collected	12/15/93
% moisture	3.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	5.1	4	10		80A
Gross Beta	Beta	26	4.8	6	10		80B
Selenium 79	15758-45-9	0.57	0.77	1	10	U	SE
Strontium 90	10098-97-2	0.42	0.26	0.7	1	U	Y
Technetium 99	14133-76-7	4.2	0.37	0.3	0.5		TC
Iodine 129	15046-84-1	0.021	0.71	2	2	U	I
Uranium 233/234		3.2	0.25	0.05	0.3		U
Uranium 235	15117-96-1	0.18	0.051	0.03	0.3	J	U
Uranium 238		3.3	0.26	0.04	0.3		U
Total Uranium (ug/g)	7440-61-1	8.7	1.7	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.041	0.027	0.02	0.2	J	NP
Plutonium 238	13981-16-3	0.015	0.029	0.05	0.05	U	PU
Plutonium 239/240		-0.002	0.010	0.03	0.05	U	PU
Americium 241	14596-10-2	-0.003	0.006	0.01	0.05	U	TP
Curium 244	13981-15-2	0.006	0.006	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	13	2.5				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.4	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9413512.1138

N312021-05	TMA NORCAL REPORTING GROUP 7304 DATA SHEET, cont	B09DR1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-05	Client sample id	B09DR1
Dept sample id	7304-005	Location/Matrix	200-UP-1 SOLID
Received	12/20/93	Collected	12/15/93
% moisture	3.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.5		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.48	0.25				GAM
Radium 228	15262-20-1	U		1		U	GAM
Thorium 228	14274-82-9	0.63	0.14				GAM
Thorium 232	7440-29-1	U		1		U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

N312021-06

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR3

SDG 7304 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N312021-06 Client sample id B09DR3
Dept sample id 7304-006 Location/Matrix 200-UP-2 SOLID
Received 12/20/93 Collected 12/14/93
% moisture 1.9 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	11	4.4	4	10		80A
Gross Beta	Beta	120	8.1	6	10		80B
Selenium 79	15758-45-9	0	0	2	10	U	SE
Strontium 90	10098-97-2	49	3.4	0.9	1		Y
Technetium 99	14133-76-7	0.31	0.15	0.4	0.5	U	TC
Iodine 129	15046-84-1	0.19	0.71	2	2	U	I
Uranium 233/234		5.0	0.36	0.07	0.3		U
Uranium 235	15117-96-1	0.38	0.076	0.04	0.3		U
Uranium 238		5.1	0.36	0.06	0.3		U
Total Uranium (ug/g)	7440-61-1	15	3.1	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.011	0.011	0.02	0.2	U	NP
Plutonium 238	13981-16-3	-0.007	0.044	0.08	0.05	U	PU
Plutonium 239/240		0.015	0.022	0.04	0.05	U	PU
Americium 241	14596-10-2	0	0.011	0.02	0.05	U	TP
Curium 244	13981-15-2	0.002	0.007	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	19	3.5				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	0.78	0.21		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9713517.1140

N312021-06

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DR3

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-06	Client sample id	B09DR3
Dept sample id	7304-006	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	1.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.4	0.1	U	GAM
Radium 226	13982-63-3	0.46	0.27				GAM
Radium 228	15262-20-1	1.1	0.81				GAM
Thorium 228	14274-82-9	0.81	0.13				GAM
Thorium 232	7440-29-1	1.1	0.81				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

N312021-11

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR4

SDG 7304
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N312021-11
Dept sample id 7304-011
Received 12/22/93
% moisture 3.0
Client sample id B09DR4
Location/Matrix 200-UP-2 SOLID
Collected 12/16/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	29	6.5	4	10		80A
Gross Beta	Beta	41	5.7	6	10		80B
Selenium 79	15758-45-9	0.39	0.92	2	10	U	SE
Strontium 90	10098-97-2	0.64	0.55	1	1	U	Y
Technetium 99	14133-76-7	11	0.36	0.3	0.5		TC
Iodine 129	15046-84-1	0.59	0.81	2	2	U	I
Uranium 233/234		13	0.77	0.1	0.3		U
Uranium 235	15117-96-1	1.0	0.13	0.04	0.3		U
Uranium 238		14	0.79	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	43	8.9	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.004	0.028	0.06	0.2	U	NP
Plutonium 238	13981-16-3	0.006	0.011	0.03	0.05	U	PU
Plutonium 239/240		0.006	0.006	0.02	0.05	U	PU
Americium 241	14596-10-2	0.002	0.007	0.01	0.05	U	TP
Curium 244	13981-15-2	0.010	0.010	0.01	0.05	J	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	9.4	2.2				GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.4	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

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TMA NORCAL
REPORTING GROUP 7304

N312021-11

DATA SHEET, cont

B09DR4

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-11	Client sample id	B09DR4
Dept sample id	7304-011	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/16/93
% moisture	3.0	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.6		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.4	0.1	U	GAM
Radium 226	13982-63-3	0.31	0.23				GAM
Radium 228	15262-20-1	0.97	0.68				GAM
Thorium 228	14274-82-9	0.35	0.16				GAM
Thorium 232	7440-29-1	0.97	0.68				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

N312021-12

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR5

SDG 7304
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N312021-12
Dept sample id 7304-012
Received 12/22/93
% moisture 3.2
Client sample id B09DR5
Location/Matrix 200-UP-2 SOLID
Collected 12/16/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	19	5.3	4	10		80A
Gross Beta	Beta	140	8.3	6	10		80B
Selenium 79	15758-45-9	-0.71	0.90	2	10	U	SE
Strontium 90	10098-97-2	36	3.2	0.9	1		Y
Technetium 99	14133-76-7	0.46	0.11	0.3	0.5	J	TC
Iodine 129	15046-84-1	0	0.82	2	2	U	I
Uranium 233/234		6.8	0.64	0.1	0.3		U
Uranium 235	15117-96-1	0.39	0.11	0.06	0.3		U
Uranium 238		7.0	0.66	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	19	4.0	0.2	0.1	X	U_T
Neptunium 237	13994-20-2	0.003	0.016	0.04	0.2	U	NP
Plutonium 238	13981-16-3	-0.010	0.010	0.05	0.05	U	PU
Plutonium 239/240		0	0.020	0.05	0.05	U	PU
Americium 241	14596-10-2	0.007	0.013	0.02	0.05	U	TP
Curium 244	13981-15-2	-0.002	0.004	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	13	3.0				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.4		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.4		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	29	0.86		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

TMA NORCAL
REPORTING GROUP 7304

N312021-12

DATA SHEET, cont

B09DR5

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-12	Client sample id	B09DR5
Dept sample id	7304-012	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/16/93
% moisture	3.2	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.4	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.6	0.1	U	GAM
Radium 226	13982-63-3	1.1	0.46				GAM
Radium 228	15262-20-1	1.0	0.56				GAM
Thorium 228	14274-82-9	1.4	0.45				GAM
Thorium 232	7440-29-1	1.0	0.56				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

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N312021-13

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR6

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-13	Client sample id	B09DR6
Dept sample id	7304-013	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/20/93
% moisture	7.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	4.9	4	10		80A
Gross Beta	Beta	33	5.1	6	10		80B
Selenium 79	15758-45-9	0.12	0.95	2	10	U	SE
Strontium 90	10098-97-2	0.27	0.33	1	1	U	Y
Technetium 99	14133-76-7	2.1	0.16	0.2	0.5		TC
Iodine 129	15046-84-1	0.31	0.78	2	2	U	I
Uranium 233/234		3.7	0.38	0.08	0.3		U
Uranium 235	15117-96-1	0.20	0.082	0.05	0.3	J	U
Uranium 238		3.7	0.39	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	11	2.1	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.004	0.025	0.05	0.2	U	NP
Plutonium 238	13981-16-3	-0.005	0.032	0.07	0.05	U	PU
Plutonium 239/240		-0.016	0.022	0.06	0.05	U	PU
Americium 241	14596-10-2	-0.003	0.010	0.02	0.05	U	TP
Curium 244	13981-15-2	-0.002	0.003	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	16	3.3				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.6	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

TMA NORCAL
REPORTING GROUP 7304

N312021-13

DATA SHEET, cont

B09DR6

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-13 | Client sample id B09DR6
Dept sample id 7304-013 | Location/Matrix 200-UP-2 SOLID
Received 12/22/93 | Collected 12/20/93
% moisture 7.1 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.9		U	GAM
Europium 152	14683-23-9	U		0.4	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.5	0.1	U	GAM
Radium 226	13982-63-3	0.49	0.35				GAM
Radium 228	15262-20-1	1.1	0.69				GAM
Thorium 228	14274-82-9	1.3	0.34				GAM
Thorium 232	7440-29-1	1.1	0.69				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

TMA/Norcal

Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

April 1, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7304 is comprised of neptunium-237 reanalysis results for sample BO9DQ1. The sample is from Project Designation/Sampling Location 200-UP-2, delivered under Field Logbook No. EFL-1091. A Chain-of-Custody ID was not provided. One 1000 mL plastic bottle of sample was received for analysis.

2.0 ANALYSIS NOTES

2.1 Neptunium-237 Analyses

The original analysis results for samples BO9DQ1 and BO9DQ6 showed positive neptunium-237 activity. These samples also showed some uranium contamination so they were reanalyzed and the positive result for sample BO9DQ6 was confirmed. The reanalysis result for sample BO9DQ1 was below the MDA and the new result is provided in this report.

The found/added ratio for the laboratory control sample is 85% which is slightly below the 3σ protocol limits (88-112)%, but within the (80-120)% contract limits.

9213517.1148

N312021-02

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ1

SDG 7304
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N312021-02
Dept sample id 7304-002
Received 12/08/93
% moisture 5.9
Client sample id B09DQ1
Location/Matrix 200-UP-2 SOLID
Collected 12/06/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	N.R.			10		80A
Gross Beta	Beta	N.R.			10		80B
Strontium 90	10098-97-2	N.R.			1		Y
Technetium 99	14133-76-7	N.R.			0.5		TC
Iodine 129	15046-84-1	N.R.			2		I
Uranium 233/234		N.R.			0.3		U
Uranium 235	15117-96-1	N.R.			0.3		U
Uranium 238		N.R.			0.3		U
Total Uranium (ug/g)	7440-61-1	N.R.			0.1		U_T
Neptunium 237	13994-20-2	0.012	0.016	0.03	0.2	U	NP
Plutonium 238	13981-16-3	N.R.			0.05		PU
Plutonium 239/240		N.R.			0.05		PU
Americium 241	14596-10-2	N.R.			0.05		TP
Curium 244	13981-15-2	N.R.			0.05		TP

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.29
Report date

9713512.1149

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-06-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322291 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-06-93

~~3)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and ~~Print~~ Names)

Relinquished by:	Received by:	Date/Time:
1305 Joseph E Rogers 12-7-93	J.D. Fanther J.D. Fanther	12/7/93 1305
Relinquished by: 12/7/93 J.D. Fanther J.D. Fanther 1335	Received by: Sellinc 325/H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1150

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 12-06-93
Company Contact L E ROGERS Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DQ1	S	12-06-93	0955	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			SER 12-06-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			SER 12-06-93	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

*Type of Sample	A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
	DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
	DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

OVERNIGHT DELIVERY 97-3517.1151

Contractor WESTINGHOUSE HANFORD COMPANY	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W94-0-0138-33

PART I – TO BE COMPLETED BY ORIGINATOR

Department ENVIRONMENTAL	Section ENV FIELD SERVICES	Unit ENV SAMPLING & MONITORING

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Contractor ☐ Vendor

Shipped to	Off-site Custodian
TMA INTERCAL 2020 WRIGHT AVE. RICHMOND, CA 94804	FELIX SANCHEZ
	Full Title PROJECT COORDINATOR

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 CTR.	SML 386 poly cooler. Soil samples that are double-bagged packed in wet ice and vermiculite. Samples are non-hazardous. Sample #'s: 10191, 10192, ~~10193~~	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

To support sampling activities at 200 Area

FILE OF FINDING 251 [illegible]

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release S.N. 6.6	RM Survey No. 10773	Date 12/17/93
Location of Property (Area & Bldg.) 200 WEST	Contact J.E. [illegible]	Phone 372-1176
Date Ready for Shipment 12-17-93	Cost Code to be Charged [illegible] CT2AA	Approximate Date This Property will be Returned N/A
Originated By [illegible]	Date [illegible]	Authorized By [illegible] Date [illegible]
Signature and Name of Property Control	Custodian Date	Property Management Approval [illegible] Date [illegible]

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient [illegible]	Return Order No. 36A	Date Issued	Purchase Order No.	Date Issued
Date 12-17-93				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/89)

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill Shipper XXX Bill to Consignee ☐ Third Party Billing ☐

EMERY WORLDWIDE

A CF Company

SERVICES **

UNITED STATES / CANADA: Same Day (Extra Charges) ☐; AM ☐ PM ☐; Second Day ☐; XX

INTERNATIONAL: Express ☐; Standard Plus ☐; Preferred ☐; Standard ☐; Business Documents ☐; Customs Clearance ☐; Delivery ☐

E Shipper's Account Number: 850281585

Date: 12-21-93 Origin: PSC Service Number: 251900821 7

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA Canada ☐

To:
TMA/NORCAL
TMA/NORCAL DELORES SANCHEZ
2030 WRIGHT AVENUE
RICHMOND CA USA Canada ☐ Hold for Pick Up ☐

Tariff Dest. Gateway

$

EMERY WORLDWIDE will accept Consignee check with all risks being assumed by Shipper, including but not limited to [illegible]

Customer's Reference Numbers: W81710 PT2BA W94-0-0138#39 99352

E Consignee's Account Number: 94804

Description	Pcs.	L	W	H	Total Pieces	Total Weight
1 COOLER SML 315 SOIL SAMPLES	1	24	16	16	1	65

FOR INFORMATION ON RATES CALL [illegible]

Declared Value $

2519008217

Remarks: OVERNIGHT DELIVERY

Shipper's Signature X C.A. Kelly 12-21-93

Zip Ship ☐
For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used
Urgent Letter 9X12 ☐ Urgent Pack 12X15 ☐

International Shipments: Free Domicile ☐ Commodity Code

Third Party Account Number mandatory for Third Party Billing. E Third Party Account Number

Base Charge

International Customs Value

International Insurance

Total Transportation Charges

Other Charges/Advance at Origin ☐ OC/AO- $

1-OAK-A

Terms and Conditions on Back

9713517.1152

36B

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper [X] Bill to Consignee ☐ Third Party Billing ☐

EMERY WORLDWIDE

A CF Company

SERVICES **

UNITED STATES: Same Day (Extra Charges) ☐ AM ☐ Second Day ☐

CANADA: PM ☐ Saturday Delivery [X]

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date | Origin: PSC | Shipment Number: 251900811 8

E Shipper's Account Number: 850281585

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA 99352

To:
TMA/NORCAL
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA USA 94804

Tariff Dest. | Gateway

Check $

Held for Pick Up ☐ Canada ☐

EMERY WORLDWIDE will accept consignee's check with all risks be[illegible] Shipper, including but not limited to [illegible] payment, fraud [illegible] misrepresentation.

Canada ☐

E Consignee's Account Number

Customer's Reference Numbers: 81710 PT2BA W94-0-0138-3

Description: 1 SML 386 1 Sample [illegible]

Pcs.	Dimensions L	W	H	Total Pieces	Total Weight (lbs.)
1	24	11	16	1	60

FOR INFORMATION OR RATES CALL 1-800 44 EMERY (1-800-443-6379)

Declared Value $

251900811 8

Remarks: SATURDAY DELIVERY

Zip Ship ☐ For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used: Urgent Letter 9X12 ☐ Urgent Pack 12X15 ☐

Shipper's Signature X

International Shipments: Commodity Code

Free Domicile ☐

Third Party Account Number mandatory for Third Party Billing. E Third Party Account Number

International Customs Value | International Insurance

Base Charge | Total Transportation Charges | Charges/Advance at Origin OC/AO- $

1-OAK SAT

Terms and Conditions on Back

97 4512 1153

36 C

001 001

BURLINGTON AIR EXPRESS

CORPORATE SUPPORT GROUP
18200 VON KARMAN AVE.
IRVINE, CA 92715

997 332 291
AIRBILL NUMBER

DATE	ORIGIN	DEST. SORT CODE
12-07-93		

1 SHIPPER'S REFERENCE NO. [illegible]
SHIPPER'S ACCOUNT NO.
COMPANY
DEPT./FLOOR C/O WESTINGHOUSE
FROM (YOUR NAME) HARDARD CO
PHONE NO. (509) 376-6665
WESTINGHOUSE SHIPPING DEPT
STREET ADDRESS
CITY
STATE
ZIP (REQUIRED)

2 CONSIGNEE'S REFERENCE NO.
CONSIGNEE'S ACCOUNT NO.
COMPANY TMA/NORCAL
DEPT./FLOOR
TO (CONSIGNEE NAME) TMA/NORCAL DELORES SANCHEZ
PHONE NO.
ACCURATE STREET ADDRESS (BURLINGTON CANNOT DELIVER TO A P.O. BOX)
2030 WRIGHT AVENUE
CITY RICHMOND
STATE CA
ZIP (REQUIRED) [redacted]

C.O.D.
$
CONSIGNEE'S CHECK O.K. MARK IF APPLICABLE ☐
BURLINGTON AIR EXPRESS WILL COLLECT CONSIGNEE'S CHECK MADE PAYABLE ONLY TO THE SHIPPER FOR THE VALUE OF THE GOODS IN THE AMOUNT SHOWN ABOVE

DECLARED VALUE
$

LIMIT OF LIABILITY
LIABILITY IS AGREED AND UNDERSTOOD TO BE $50.00 OR $.50 PER POUND, WHICHEVER IS GREATER, UNLESS A HIGHER VALUE IS DECLARED AND APPLICABLE CHARGES PAID. SEE REVERSE SIDE OF AIRBILL, PARAGRAPH 8, FOR DECLARED VALUE LIMITATIONS

1-800-CALL-BAX FOR INFORMATION OR THE BAX OFFICE NEAREST YOU

3 BILLING INFORMATION
☐ PREPAID (SHIPPER) $ _____ CASH RECEIVED (PAID IN ADVANCE)
☐ COLLECT (CONSIGNEE)
☐ 3RD PARTY (ACCT. NO. OR BILLING ADDRESS REQ'D.)
ACCOUNT NO.
COMPANY/NAME
STREET ADDRESS
CITY
STATE
ZIP

997 332 291
AIRBILL NUMBER

4 SERVICE REQUESTED
☐ OVERNIGHT (NEXT BUSINESS DAY)
☐ SECOND DAY
☐ NEXT FLIGHT OUT
☐ _____
CHECK BELOW IF PACKAGE IS:
☐ LETTER
☐ G.O.H. (GARMENT ON HANGER)

5 HANDLING INFORMATION (* SPECIAL RATE MAY APPLY)
☐ HOLD AT BAX ☐ *DANGEROUS GOODS ☐ *SATURDAY DELIVERY ☐ *SPECIAL DELIVERY ☐ *CONVENTION ☐ *GOVERNMENT SHIPMENT
SPECIAL INSTRUCTIONS / ADDITIONAL REFERENCE INFORMATION:

NO. OF PCS.	WEIGHT	LENGTH	WIDTH	HEIGHT	DESCRIPTION
1	[illegible]				[illegible] SAMPLES
TOTAL PCS.	TOTAL WT.				
1	[illegible]				

_____ SKID(S) SAID TO CONTAIN _____ NO. OF PIECES

RATE QUOTE NUMBER

RECEIVED BY BAX AT ☐ SHIPPER'S DOOR ☐ BAX TERMINAL

TIME/DATE OF PICK-UP
DRIVER NO.

SIGNATURE OF SHIPPER
X [illegible]

RELEASE SIGNATURE (SENDER AUTHORIZES BAX TO DELIVER SHIPMENT WITHOUT A DELIVERY SIGNATURE AS PER CONDITIONS ON REVERSE OF THIS PAGE.)
X

SIGNED FOR BAX
X

OUTSIDE CARRIER:
CHARGES ADVANCED
$
PRO NUMBER
CARRIER NAME

OP 100 (11-92)

NON NEGOTIABLE AIRBILL SUBJECT TO TERMS AND CONDITIONS OF CONTRACT ON REVERSE

CONSIGNEE COPY

T 96

997 332 291

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

4230852986

AIRBILL PACKAGE TRACKING NUMBER 4230852986

RECIPIENT'S COPY

1 Date 12-14-93

From (Your Name) Please Print: G.O. BOWESS

Your Phone Number (Very Important): (509) 376-7627

Company:

Department/Floor No.:

Street Address: (EMERGENCY CONTACT PHONE) (NUMBER 509-373-3800)

City: [illegible]

State: WA

ZIP Required: [illegible]

2 To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very Important): ( )

Company: TWA/NORCAL

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 2030 WRIGHT AVE.

City: RICHMOND

State: CA

ZIP Required: 94804

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)
224-5365 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY
81710 RT24 OF MATERIAL (NOT EMERGENCY RESPONSE GUIDE #51 ATTACHED)

H IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)
Street Address
City
State
ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card
5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning) 11 [X]	Standard Overnight (Delivery by next business afternoon) 51 [ ]
Economy Two-Day (Delivery by second business day) 30 [ ]	Government Overnight (Restricted to authorized users only) 41 [ ]

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT **
† Delivery commitment may be later in some areas
*Declared Value Limit $100.
**Call for delivery schedule

INSTRUCTIONS (Mark appropriate boxes)
- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [ ] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [X] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE lbs
- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845

x kg. ft
7 [ ] OTHER SPECIAL SERVICE
11 [ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT in Pounds Only
1	61
Total 1	Total 61

DIM SHIPMENT (Chargeable Weight) [ ] lbs

Received At
1 [ ] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 5 [ ] Station

FedEx Emp.

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip

Received By
X
Date/Time Received FedEx Employee Number

SIGNATURE RELEASE UNAVAILABLE

Date/Time

REVISION DATE 2/91
FORMAT #069
069
MBFAN 1/92
© 1991, 91 F.E.C.
PRINTED IN U.S.A.

36 E

FEDERAL EXPRESS

[redacted] of 2

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4230852942

4230852942

[redacted] Date 12-21-93

RECIPIENT'S COPY

From (Your Name) Please Print: G.O. BONESS

Your Phone Number (Very Important): (509) 376-7627

Company:

Department/Floor No.:

Street Address: (EMERGENCY CONTACT PHONE) (NUMBER 509-372-3800)

City:

State:

ZIP Required:

2 To (Recipient's Name) Please Print: DELORES SANCHEZ

Recipient's Phone Number (Very Important): ( )

Company: TMA/NORCAL

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes): 2030 WRIGHT AVENUE

City: RICHMOND

State: CA

ZIP Required: 94804

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.): REM-6396 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY [illegible] DOT EMERGENCY RESPONSE GUIDE ASS ATTACHED

H IF HOLD FOR PICK-UP, Print FEDEX Address Here (Not available at all locations)

Street Address:

City:

State:

ZIP Required:

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct No 3 [ ] Bill 3rd Party FedEx Acct No 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)	Standard Overnight (Delivery by next business afternoon†)
11 [X]	51 [ ]
Economy Two-Day (Delivery by second business day†)	**Government Overnight** (Restricted to authorized users only)
30 [ ]	41 [ ]

Freight Service (for Extra Large or any package over 150 lbs.)

70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required)

80 [ ] TWO-DAY FREIGHT **

† Delivery commitment may be later in some areas.

*Declared Value Limit $100

**Call for delivery schedule

INSTRUCTIONS (Mark appropriate boxes)

- Dangerous Goods as per attached Shipper's Declaration [ ]
- Dangerous Goods Shipper's Declaration not required [X]
- Cargo Aircraft only [ ]

DELIVERY AND SPECIAL HANDLING (Check services required)

1 [ ] HOLD FOR PICK-UP (Fill in Box H)

2 [X] DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]

4 [X] DANGEROUS GOODS (Extra charge)

6 [ ] DRY ICE Lbs

- Dangerous Goods Shipper's Declaration not required
- Dry Ice, 9, UN 1845,

x kg. ☒

7 [ ] OTHER SPECIAL SERVICE

11 [ ]

12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT In Pounds Only
1	57
Total	Total
1	57

DIM SHIPMENT (Chargeable Weight) [ ] lbs

Received At: [X] 1 Regular Stop; 2 [ ] On-Call Stop; 3 [ ] Drop Box; 4 [ ] BSC; 5 [ ] Station

FedEx Emp. No

Date/Time

Emp. No

Date

[ ] Cash Received

[ ] Return Shipment

[ ] Third Party [ ] Chg. To Del [ ] Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received

FedEx Employee Number

SIGNATURE RELEASE UNAVAILABLE

REVISION DATE 2/91

FORMAT #069

069

MBFAN 1/92

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364

95 1254 7.56

9213512.1157

VALIDATION SUMMARY

9413517.1158

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

APR 1994
RECEIVED
TQO

Golder Associates

April 18, 1994

Our ref: 923-E418
S/O/3012

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills, MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGES, 200-UP-2 DATA VALIDATION PROJECT, TASK ORDER S-94-18, CONTRACT MJK-SVV-073750

Dear Ms. Duncan:

This letter transmits data validation packages for the 200-UP-2 data validation project. The following data validation packages are enclosed:

9401L186-WES-1462
B09DT4-TMA-690
B09DQ6-TMA-681

If you have any questions regarding the enclosed, please contact us.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Christina I. Jensen
Task Manager

for Douglas G. Dunster
Project Director

RECEIVED
APR 19 1994
VALIDATION DOCUMENTATION
SDLA

Enclosures
CC: P.K. Brockman, SAIC
K. Angelos

9413512.1159

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 5, 1994

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DQ6-TMA-681 (923-E418, Filename B09DQ6.VOA)

INTRODUCTION

This memo presents the results of data validation on data package B09DQ6-TMA-681 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DP9	12/03/93	SOIL	SEE NOTE 1
B09DQ0	12/03/93	SOIL	
B09DQ1	12/06/93	SOIL	
B09DQ6	12/09/93	SOIL	
B09DQ7	12/13/93	SOIL	
B09DQ8	12/13/93	SOIL	
B09DQ9	12/14/92	SOIL	
B09DR0	12/14/93	SOIL	
B09DR1	12/15/93	SOIL	
B09DR2	12/15/93	SOIL	
B09DR3	12/14/93	SOIL	
B09DR4	12/16/93	SOIL	
B09DR5	12/16/93	SOIL	
B09DR6	12/20/93	SOIL	

Note 1. All samples were analyzed for CLP TCL volatile organics.

APR 1 1994 VALIDATION DOCUMENT

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

001

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method. Samples B09DQ6, B09DQ8, B09DQ9, B09DR0, and B09DR5 were analyzed as medium level samples due to the high concentration of tentatively identified compounds (TIC) as summarized in the laboratory case narrative. Therefore, the reported detection limits for the indicated samples reflect this dilution.

Completeness. The data package was complete for all requested analyses. A total of fourteen samples were validated in this data package with a total of 462 determinations reported, of which 457 were deemed valid. This results in a completeness of 99 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

The following major deficiencies were identified during data validation which required qualification of data as unusable.

- Continuing calibration relative response factors (RRF) for 1,1,2,2-tetrachloroethane were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data as estimated.

Laboratory Blanks

- Methylene chloride, acetone, and toluene, and chloromethane were detected in the associated laboratory blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the sample(s) and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).

- TICs were detected in the sample(s) and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

9213517.1161

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

9713517.1162

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.1164

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR: [illegible]	DATE: April 15, 1994	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
METHYLENE CHLORIDE	U	B09DQ1 B09DQ6 B09DQ7 B09DR1 B09DR2 B09DR3 B09DR4 B09DR6	PRESENT IN BLANK
ACETONE	U	B09DQ7 B09DR1 B09DR2 B09DR3 B09DR4 B09DR6	PRESENT IN BLANK
TOLUENE	U	B09DR4 B09DR6	PRESENT IN BLANK
CHLOROMETHANE	U	B09DR2	PRESENT IN BLANK
1,1,2,2-TETRACHLOROETHANE	UR	B09DQ6 B09DQ8 B09DQ9 B09DR0 B09DR5	CCV RRF < 0.5

97i3517.1166

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DP9		B09DQ0		B09DQ1		B09DQ6		B09DQ7		B09DQ8	
	Date	12-3-93		12-3-93		12-6-93		12-9-93		12-13-93		12-13-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
BROMOMETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
VINYL CHLORIDE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
CHLOROETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
METHYLENE CHLORIDE	UG/KG	2.000	J	2.000	J	11.000	U	13000.000	U	10.000	U	13000.000	U
ACETONE	UG/KG	6.000	J	7.000	J	11.000	U	13000.000	U	10.000	U	13000.000	U
CARBON DISULFIDE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
CHLOROFORM	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
2-BUTANONE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
TRICHLOROETHENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
BENZENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
BROMOFORM	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
2-HEXANONE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	UR	10.000	U	13000.000	UR
TOLUENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
CHLOROBENZENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
ETHYLBENZENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
STYRENE	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	11.000	U	11.000	U	13000.000	U	10.000	U	13000.000	U

Verified

4/8/94

009

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ9		B09DR0		B09DR1		B09DR2		B09DR3		B09DR4	
	Date	12-14-93		12-14-93		12-15-93		12-15-93		12-14-93		12-16-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMOMETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
VINYL CHLORIDE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
ACETONE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	18.000	U	10.000	U
CARBON DISULFIDE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROFORM	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
2-BUTANONE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TRICHLOROETHENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BENZENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMOFORM	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
2-HEXANONE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	4900.000	UR	5100.000	UR	10.000	U	10.000	U	10.000	U	10.000	U
TOLUENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROBENZENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
ETHYLBENZENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
STYRENE	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	4900.000	U	5100.000	U	10.000	U	10.000	U	10.000	U	10.000	U

Verified
4/8/94

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DR5		B09DR6	
	Date	12-16-93		12-20-93	
	Location	---		---	
	Depth	---		---	
	Type	---		---	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	1300.000	U	11.000	U
BROMOMETHANE	UG/KG	1300.000	U	11.000	U
VINYL CHLORIDE	UG/KG	1300.000	U	11.000	U
CHLOROETHANE	UG/KG	1300.000	U	11.000	U
METHYLENE CHLORIDE	UG/KG	1300.000	U	11.000	U
ACETONE	UG/KG	1300.000	U	11.000	U
CARBON DISULFIDE	UG/KG	1300.000	U	11.000	U
1,1-DICHLOROETHENE	UG/KG	1300.000	U	11.000	U
1,1-DICHLOROETHANE	UG/KG	1300.000	U	11.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	1300.000	U	11.000	U
CHLOROFORM	UG/KG	1300.000	U	11.000	U
1,2-DICHLOROETHANE	UG/KG	1300.000	U	11.000	U
2-BUTANONE	UG/KG	1300.000	U	11.000	U
1,1,1-TRICHLOROETHANE	UG/KG	1300.000	U	11.000	U
CARBON TETRACHLORIDE	UG/KG	1300.000	U	11.000	U
BROMODICHLOROMETHANE	UG/KG	1300.000	U	11.000	U
1,2-DICHLOROPROPANE	UG/KG	1300.000	U	11.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	1300.000	U	11.000	U
TRICHLOROETHENE	UG/KG	1300.000	U	11.000	U
DIBROMOCHLOROMETHANE	UG/KG	1300.000	U	11.000	U
1,1,2-TRICHLOROETHANE	UG/KG	1300.000	U	11.000	U
BENZENE	UG/KG	1300.000	U	11.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	1300.000	U	11.000	U
BROMOFORM	UG/KG	1300.000	U	11.000	U
4-METHYL-2-PENTANONE	UG/KG	1300.000	U	11.000	U
2-HEXANONE	UG/KG	1300.000	U	11.000	U
TETRACHLOROETHENE	UG/KG	1300.000	U	11.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	1300.000	UR	11.000	U
TOLUENE	UG/KG	1300.000	U	11.000	U
CHLOROBENZENE	UG/KG	1300.000	U	11.000	U
ETHYLBENZENE	UG/KG	1300.000	U	11.000	U
STYRENE	UG/KG	1300.000	U	11.000	U
XYLENES (TOTAL)	UG/KG	1300.000	U	11.000	U

Verified [illegible] 4/8/94

9213517.1170

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DP9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 0 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	6	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

Q

012

FORM I VOA Verified 4/01/94 3/90

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EPA SAMPLE NO.

B09DP9

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 0 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Q

Verified 11/01/94

9213512.1172

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R06

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	7	J
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

014

 Verified 4/01/94

9213517.1173

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31210R06

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/10/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

Q

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.78	5	JN

015

Verified 4/01/94

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EPA SAMPLE NO.

B09DQ1

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31213R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/13/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	11	U	
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	11 ~~5~~	~~BJ~~	U
67-64-1	Acetone	11	U	
75-15-0	Carbon Disulfide	11	U	
75-35-4	1,1-Dichloroethene	11	U	
75-34-3	1,1-Dichloroethane	11	U	
540-59-0	1,2-Dichloroethene (total)	11	U	
67-66-3	Chloroform	11	U	
107-06-2	1,2-Dichloroethane	11	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	11	U	
56-23-5	Carbon Tetrachloride	11	U	
75-27-4	Bromodichloromethane	11	U	
78-87-5	1,2-Dichloropropane	11	U	
10061-01-5	cis-1,3-Dichloropropene	11	U	
79-01-6	Trichloroethene	11	U	
124-48-1	Dibromochloromethane	11	U	
79-00-5	1,1,2-Trichloroethane	11	U	
71-43-2	Benzene	11	U	
10061-02-6	trans-1,3-Dichloropropene	11	U	
75-25-2	Bromoform	11	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	11	U	
79-34-5	1,1,2,2-Tetrachloroethane	11	U	
108-88-3	Toluene	11	U	
108-90-7	Chlorobenzene	11	U	
100-41-4	Ethylbenzene	11	U	
100-42-5	Styrene	11	U	
1330-20-7	Xylene (total)	11	U	

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FORM I VOA Verified [signature] 4/9/94 3/90

~~000152~~

EPA SAMPLE NO.

B09DQ1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31213R03

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: not dec. 6 Date Analyzed: 12/13/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

-017

Verified 4/01/94

~~000108~~

EPA SAMPLE NO.

B09DQ6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31223M06

Level: (low/med) MED Date Received: 12/15/93

% Moisture: not dec. 9 Date Analyzed: 12/23/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	13000	U	
74-83-9	Bromomethane	13000	U	
75-01-4	Vinyl Chloride	13000	U	
75-00-3	Chloroethane	13000	U	
75-09-2	Methylene Chloride	13000 ~~2300~~	~~BJ~~	u
67-64-1	Acetone	13000	U	
75-15-0	Carbon Disulfide	13000	U	
75-35-4	1,1-Dichloroethene	13000	U	
75-34-3	1,1-Dichloroethane	13000	U	
540-59-0	1,2-Dichloroethene (total)	13000	U	
67-66-3	Chloroform	13000	U	
107-06-2	1,2-Dichloroethane	13000	U	
78-93-3	2-Butanone	13000	U	
71-55-6	1,1,1-Trichloroethane	13000	U	
56-23-5	Carbon Tetrachloride	13000	U	
75-27-4	Bromodichloromethane	13000	U	
78-87-5	1,2-Dichloropropane	13000	U	
10061-01-5	cis-1,3-Dichloropropene	13000	U	
79-01-6	Trichloroethene	13000	U	
124-48-1	Dibromochloromethane	13000	U	
79-00-5	1,1,2-Trichloroethane	13000	U	
71-43-2	Benzene	13000	U	
10061-02-6	trans-1,3-Dichloropropene	13000	U	
75-25-2	Bromoform	13000	U	
108-10-1	4-Methyl-2-Pentanone	13000	U	
591-78-6	2-Hexanone	13000	U	
127-18-4	Tetrachloroethene	13000	U	
79-34-5	1,1,2,2-Tetrachloroethane	13000	~~U~~	UR
108-88-3	Toluene	13000	U	
108-90-7	Chlorobenzene	13000	U	
100-41-4	Ethylbenzene	13000	U	
100-42-5	Styrene	13000	U	
1330-20-7	Xylene (total)	13000	U	

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FORM I VOA Verified 4/8/94 3/90

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~~000109~~

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31223M06

Level: (low/med) MED Date Received: 12/15/93

% Moisture: not dec. 9 Date Analyzed: 12/23/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	SUBSTITUTED CYCLOHEXANE	13.30	22000	J	J
2.	UNKNOWN HYDROCARBON	14.45	16000	J	J
3.	SUBSTITUTED CYCLOHEXANE	15.88	29000	J	J
4.	SUBSTITUTED CYCLOHEXANE	16.60	18000	J	J
5.	UNKNOWN HYDROCARBON	18.10	22000	J	J
6.	SUBSTITUTED CYCLOHEXANE	18.23	33000	J	J
7.	UNKNOWN HYDROCARBON	18.70	15000	J	J
8.	UNKNOWN ALKANE	19.05	44000	J	J
9.	UNKNOWN POLYNUCLEAR AROMATIC	19.43	74000	J	J
10.	UNKNOWN HYDROCARBON	20.60	76000	J	J

Verified 4/4/94

~~000087~~
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~4~~	~~BJ~~	U
67-64-1	Acetone	10 ~~4~~	~~BJ~~	U
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

Verified 3/30/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M18

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 10 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	13000	U	
74-83-9	Bromomethane	13000	U	
75-01-4	Vinyl Chloride	13000	U	
75-00-3	Chloroethane	13000	U	
75-09-2	Methylene Chloride	13000	U	
67-64-1	Acetone	13000	U	
75-15-0	Carbon Disulfide	13000	U	
75-35-4	1,1-Dichloroethene	13000	U	
75-34-3	1,1-Dichloroethane	13000	U	
540-59-0	1,2-Dichloroethene (total)	13000	U	
67-66-3	Chloroform	13000	U	
107-06-2	1,2-Dichloroethane	13000	U	
78-93-3	2-Butanone	13000	U	
71-55-6	1,1,1-Trichloroethane	13000	U	
56-23-5	Carbon Tetrachloride	13000	U	
75-27-4	Bromodichloromethane	13000	U	
78-87-5	1,2-Dichloropropane	13000	U	
10061-01-5	cis-1,3-Dichloropropene	13000	U	
79-01-6	Trichloroethene	13000	U	
124-48-1	Dibromochloromethane	13000	U	
79-00-5	1,1,2-Trichloroethane	13000	U	
71-43-2	Benzene	13000	U	
10061-02-6	trans-1,3-Dichloropropene	13000	U	
75-25-2	Bromoform	13000	U	
108-10-1	4-Methyl-2-Pentanone	13000	U	
591-78-6	2-Hexanone	13000	U	
127-18-4	Tetrachloroethene	13000	U	
79-34-5	1,1,2,2-Tetrachloroethane	13000	~~U~~	UR
108-88-3	Toluene	13000	U	
108-90-7	Chlorobenzene	13000	U	
100-41-4	Ethylbenzene	13000	U	
100-42-5	Styrene	13000	U	
1330-20-7	Xylene (total)	13000	U	

Verified 3/30/94

FORM I VOA

3/90

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~~000090~~
EPA SAMPLE NO.

B09DQ8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M18

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 10 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 10.0 (uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN ALKANE	17.28	9700	~~J~~	J
2.	UNKNOWN CYCLOALCOHOL	18.08	9700	~~J~~	J
3.	UNKNOWN HYDROCARBON	18.23	14000	~~J~~	J
4.	UNKNOWN ALKANE	18.68	6900	~~J~~	J
5.	UNKNOWN ALKANE	19.03	57000	~~J~~	J
6.	UNKNOWN POLYNUCLEAR AROMATIC	19.42	28000	~~J~~	J
7.	UNKNOWN HYDROCARBON	19.62	9700	~~J~~	J
8.	UNKNOWN HYDROCARBON	20.22	13000	~~J~~	J
9.	UNKNOWN ALKANE	20.40	26000	~~J~~	J
10.	UNKNOWN HYDROCARBON	20.58	61000	~~J~~	J

Verified
3/30/94

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M15

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93 3/30/94

GC Column: CAP ID: 0.530 (mm) Dilution Factor: ~~0.2~~ 0.1

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

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

CAS NO.	COMPOUND		Q	Q
74-87-3	Chloromethane	4900	U	
74-83-9	Bromomethane	4900	U	
75-01-4	Vinyl Chloride	4900	U	
75-00-3	Chloroethane	4900	U	
75-09-2	Methylene Chloride	4900	U	
67-64-1	Acetone	4900	U	
75-15-0	Carbon Disulfide	4900	U	
75-35-4	1,1-Dichloroethene	4900	U	
75-34-3	1,1-Dichloroethane	4900	U	
540-59-0	1,2-Dichloroethene (total)	4900	U	
67-66-3	Chloroform	4900	U	
107-06-2	1,2-Dichloroethane	4900	U	
78-93-3	2-Butanone	4900	U	
71-55-6	1,1,1-Trichloroethane	4900	U	
56-23-5	Carbon Tetrachloride	4900	U	
75-27-4	Bromodichloromethane	4900	U	
78-87-5	1,2-Dichloropropane	4900	U	
10061-01-5	cis-1,3-Dichloropropene	4900	U	
79-01-6	Trichloroethene	4900	U	
124-48-1	Dibromochloromethane	4900	U	
79-00-5	1,1,2-Trichloroethane	4900	U	
71-43-2	Benzene	4900	U	
10061-02-6	trans-1,3-Dichloropropene	4900	U	
75-25-2	Bromoform	4900	U	
108-10-1	4-Methyl-2-Pentanone	4900	U	
591-78-6	2-Hexanone	4900	U	
127-18-4	Tetrachloroethene	4900	U	
79-34-5	1,1,2,2-Tetrachloroethane	4900	~~U~~	UR
108-88-3	Toluene	4900	U	
108-90-7	Chlorobenzene	4900	U	
100-41-4	Ethylbenzene	4900	U	
100-42-5	Styrene	4900	U	
1330-20-7	Xylene (total)	4900	U	

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Verified 3/30/94

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EPA SAMPLE NO.

B09DQ9

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M15

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: ~~0.2~~ 0.1 3/30/94

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN CYCLOALKANE	18.22	4100	~~J~~	N
2.	UNKNOWN ALKANE	18.22	9200	~~J~~	N
3.	UNKNOWN POLYNUCLEAR AROMATIC	19.40	4100	~~J~~	N
4.	UNKNOWN HYDROCARBON	20.40	2600	~~J~~	N
5.	UNKNOWN HYDROCARBON	20.58	9200	~~J~~	N

Verified
3/30/94

~~000093~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M06

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 5 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: ~~0.2~~ 0.1 3/30/94

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	5100	U	
74-83-9	Bromomethane	5100	U	
75-01-4	Vinyl Chloride	5100	U	
75-00-3	Chloroethane	5100	U	
75-09-2	Methylene Chloride	5100	U	
67-64-1	Acetone	5100	U	
75-15-0	Carbon Disulfide	5100	U	
75-35-4	1,1-Dichloroethene	5100	U	
75-34-3	1,1-Dichloroethane	5100	U	
540-59-0	1,2-Dichloroethene (total)	5100	U	
67-66-3	Chloroform	5100	U	
107-06-2	1,2-Dichloroethane	5100	U	
78-93-3	2-Butanone	5100	U	
71-55-6	1,1,1-Trichloroethane	5100	U	
56-23-5	Carbon Tetrachloride	5100	U	
75-27-4	Bromodichloromethane	5100	U	
78-87-5	1,2-Dichloropropane	5100	U	
10061-01-5	cis-1,3-Dichloropropene	5100	U	
79-01-6	Trichloroethene	5100	U	
124-48-1	Dibromochloromethane	5100	U	
79-00-5	1,1,2-Trichloroethane	5100	U	
71-43-2	Benzene	5100	U	
10061-02-6	trans-1,3-Dichloropropene	5100	U	
75-25-2	Bromoform	5100	U	
108-10-1	4-Methyl-2-Pentanone	5100	U	
591-78-6	2-Hexanone	5100	U	
127-18-4	Tetrachloroethene	5100	U	
79-34-5	1,1,2,2-Tetrachloroethane	5100	~~U~~	UR
108-88-3	Toluene	5100	U	
108-90-7	Chlorobenzene	5100	U	
100-41-4	Ethylbenzene	5100	U	
100-42-5	Styrene	5100	U	
1330-20-7	Xylene (total)	5100	U	

Verified 3/30/94

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EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31224M06

Level: (low/med) MED Date Received: 12/20/93

% Moisture: not dec. 5 Date Analyzed: 12/24/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: ~~0.2~~ 0.1 3/30/94

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 25.0 (uL)

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN ALKANE	17.28	5800	~~J~~	J
2.	UNKNOWN HYDROCARBON	18.12	6300	~~J~~	J
3.	UNKNOWN HYDROCARBON	18.23	14000	~~J~~	J
4.	UNKNOWN HYDROCARBON	18.43	5800	~~J~~	J
5.	UNKNOWN HYDROCARBON	18.68	5300	~~J~~	J
6.	UNKNOWN ALKANE	19.05	54000	~~J~~	J
7.	UNKNOWN CYCLOALKANE	19.17	7900	~~J~~	J
8.	UNKNOWN HYDROCARBON	19.43	12000	~~J~~	J
9.	UNKNOWN HYDROCARBON	19.62	6800	~~J~~	J
10.	UNKNOWN HYDROCARBON	20.60	42000	~~J~~	J

Verified 3/30/94

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~8~~	~~BJ~~	
67-64-1	Acetone	10 ~~8~~	~~BJ~~	
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

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FORM I VOA 3/90

028

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EPA SAMPLE NO.

B09DR1

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 3 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. 110-54-3	HEXANE	15.78	5	~~BJN~~	UJN

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FORM I VOA-TIC 3/90

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~~000097~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R05

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 0 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10 ~~2~~	~~J~~	U
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~2~~	~~BJ~~	U
67-64-1	Acetone	10	~~B~~	U
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

030

FORM I VOA Verified 3/30/94 3/90

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EPA SAMPLE NO.

B09DR2

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-07A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R05

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 0 Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.75	7	~~BJN~~

Q
JSN

031

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FORM I VOA-TIC 3/90

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31224R08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~2~~	~~BJ~~	33
67-64-1	Acetone	18	~~B~~	
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

-032

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EPA SAMPLE NO.

B09DR3

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31224R08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: not dec. 2 Date Analyzed: 12/24/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	12.87	6	~~J~~	JN

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EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 3 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~4~~	~~BJ~~	U
67-64-1	Acetone	10 ~~5~~	~~BJ~~	U
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10 ~~1~~	~~BJ~~	U
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

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EPA SAMPLE NO.

B09DR4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 3 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.75	6	JN

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31230M14

Level: (low/med) MED Date Received: 12/22/93

% Moisture: not dec. 4 Date Analyzed: 12/30/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	1300	U	
74-83-9	Bromomethane	1300	U	
75-01-4	Vinyl Chloride	1300	U	
75-00-3	Chloroethane	1300	U	
75-09-2	Methylene Chloride	1300	U	
67-64-1	Acetone	1300	U	
75-15-0	Carbon Disulfide	1300	U	
75-35-4	1,1-Dichloroethene	1300	U	
75-34-3	1,1-Dichloroethane	1300	U	
540-59-0	1,2-Dichloroethene (total)	1300	U	
67-66-3	Chloroform	1300	U	
107-06-2	1,2-Dichloroethane	1300	U	
78-93-3	2-Butanone	1300	U	
71-55-6	1,1,1-Trichloroethane	1300	U	
56-23-5	Carbon Tetrachloride	1300	U	
75-27-4	Bromodichloromethane	1300	U	
78-87-5	1,2-Dichloropropane	1300	U	
10061-01-5	cis-1,3-Dichloropropene	1300	U	
79-01-6	Trichloroethene	1300	U	
124-48-1	Dibromochloromethane	1300	U	
79-00-5	1,1,2-Trichloroethane	1300	U	
71-43-2	Benzene	1300	U	
10061-02-6	trans-1,3-Dichloropropene	1300	U	
75-25-2	Bromoform	1300	U	
108-10-1	4-Methyl-2-Pentanone	1300	U	
591-78-6	2-Hexanone	1300	U	
127-18-4	Tetrachloroethene	1300	U	
79-34-5	1,1,2,2-Tetrachloroethane	1300	~~U~~	UR
108-88-3	Toluene	1300	U	
108-90-7	Chlorobenzene	1300	U	
100-41-4	Ethylbenzene	1300	U	
100-42-5	Styrene	1300	U	
1330-20-7	Xylene (total)	1300	U	

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EPA SAMPLE NO.

B09DR5

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02A

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31230M14

Level: (low/med) MED Date Received: 12/22/93

% Moisture: not dec. 4 Date Analyzed: 12/30/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

Number TICs found: 7

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	18.23	2000	~~J~~	N
2.	UNKNOWN ALKANE	19.05	5900	~~J~~	N
3.	UNKNOWN POLYNUCLEAR AROMATIC	19.45	1800	~~J~~	N
4.	UNKNOWN ALKENE	19.63	780	~~J~~	N
5.	UNKNOWN HYDROCARBON	20.25	780	~~J~~	N
6.	UNKNOWN ALKANE	20.42	910	~~J~~	N
7.	UNKNOWN KETONE	20.62	4000	~~J~~	N

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3/30/94

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EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 7 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
74-87-3	Chloromethane	11	U	
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	\\ ~~3~~	~~BJ~~	U
67-64-1	Acetone	\\ ~~9~~	~~BJ~~	U
75-15-0	Carbon Disulfide	11	U	
75-35-4	1,1-Dichloroethene	11	U	
75-34-3	1,1-Dichloroethane	11	U	
540-59-0	1,2-Dichloroethene (total)	11	U	
67-66-3	Chloroform	11	U	
107-06-2	1,2-Dichloroethane	11	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	11	U	
56-23-5	Carbon Tetrachloride	11	U	
75-27-4	Bromodichloromethane	11	U	
78-87-5	1,2-Dichloropropane	11	U	
10061-01-5	cis-1,3-Dichloropropene	11	U	
79-01-6	Trichloroethene	11	U	
124-48-1	Dibromochloromethane	11	U	
79-00-5	1,1,2-Trichloroethane	11	U	
71-43-2	Benzene	11	U	
10061-02-6	trans-1,3-Dichloropropene	11	U	
75-25-2	Bromoform	11	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	11	U	
79-34-5	1,1,2,2-Tetrachloroethane	11	U	
108-88-3	Toluene	\\ ~~1~~	~~BJ~~	U
108-90-7	Chlorobenzene	11	U	
100-41-4	Ethylbenzene	11	U	
100-42-5	Styrene	11	U	
1330-20-7	Xylene (total)	11	U	

038

Verified 3/30/94

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EPA SAMPLE NO.

B09DR6

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: not dec. 7 Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.78	8	JN

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3/30/94

039

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-010

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 8, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP9	A3-12-010-01A	V	SOIL
B09DP9 MS	A3-12-010-01B	V	SOIL
B09DP9 MSD	A3-12-010-01C	V	SOIL
B09DQ0	A3-12-010-02A	V	SOIL
B09DQ0	A3-12-010-02B	SV	SOIL
B09DQ0 MS	A3-12-010-02C	SV	SOIL
B09DQ0 MSD	A3-12-010-02D	SV	SOIL
B09DQ0	A3-12-010-02G	K	SOIL
B09DQ1	A3-12-010-03A	V	SOIL
B09DQ1	A3-12-010-03B	SV	SOIL
B09DQ1	A3-12-010-03E	K	SOIL
B09DQ1 MS	A3-12-010-03F	K	SOIL
B09DQ1 MSD	A3-12-010-03G	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Low concentrations of Di-n-Butylphthalate were detected in the blank and all the samples that were tested for semivolatiles.

The surrogate recovery for Terphenyl-d14 on sample B09DQ0MSD, was above the contract required QC limits. In accordance with CLP protocol no further action was taken.

The spike recoveries for sample B09DQ0MSD, were above the QC limits for Phenol, 4-Nitrophenol, and 2,4-Dinitrotoluene. The results for 4-Nitrophenol have been "E" qualified since the actual concentration detected in the MSD exceeded the calibration of the instrument. The %RPD for 1,2,4-Trichlorobenzene and Acenaphthene were slightly above the QC limits. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

No Kerosene was detected in any of the samples. Sample B09DQ1 was spiked with Kerosene. The matrix spike recoveries were 69% and 70%. The blank spike was prepared at the same time and had an 72% recovery.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish

Maureen Parrish 1/21/94
Project Manager

~~000075~~

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 15, 1993

1.0 DESCRIPTION OF CASE :

One soil sample was analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ6	A3-12-029-01A	V	SOIL
B09DQ6 MS	A3-12-029-01B	V	SOIL
B09DQ6 MSD	A3-12-029-01C	V	SOIL
B09DQ6	A3-12-029-01D	SV	SOIL
B09DQ6 MS	A3-12-029-01E	SV	SOIL
B09DQ6 MSD	A3-12-029-01F	SV	SOIL
B09DQ6	A3-12-029-01J	K	SOIL
B09DQ6 MS	A3-12-029-01K	K	SOIL
B09DQ6 MSD	A3-12-029-01L	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the sample was analyzed as a medium-level soil. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner.

All of the QC results were within the limits specified by the EPA CLP SOW.

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TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the sample was concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the sample was performed by the analyst prior to injection. The large dilution was necessary based on the viscous nature of the extract. The matrix spikes and surrogates were not recoverable due to the large sample dilution. The blank, SBLK1217S2, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL. A 1:50 dilution was performed on the sample by the analyst prior to injection.

The matrix spiking solution was added at a concentration of approximately 240 ppm. Due to the large concentration of Kerosene in the sample, an accurate recovery of the matrix spiking compounds could not be obtained. The blank spike had

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a 66% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the results were reported on a wet weight basis.

All of the other QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish

Maureen Parrish 2/17/94
Project Manager

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-044

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 20, 1993

1.0 DESCRIPTION OF CASE :

Seven soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ7	A3-12-044-01A	V	SOIL
B09DQ7 MS	A3-12-044-01B	V	SOIL
B09DQ7 MSD	A3-12-044-01C	V	SOIL
B09DQ7	A3-12-044-01D	SV	SOIL
B09DQ7	A3-12-044-01F	K	SOIL
B09DQ8	A3-12-044-02A	V	SOIL
B09DQ8	A3-12-044-02B	SV	SOIL
B09DQ8 MS	A3-12-044-02C	SV	SOIL
B09DQ8 MSD	A3-12-044-02D	SV	SOIL
B09DQ8	A3-12-044-02F	K	SOIL
B09DQ9	A3-12-044-03A	V	SOIL
B09DQ9	A3-12-044-03B	SV	SOIL
B09DQ9	A3-12-044-03E	K	SOIL
B09DR0	A3-12-044-04A	V	SOIL
B09DR0 MS	A3-12-044-04G	V	SOIL
B09DR0 MSD	A3-12-044-04H	V	SOIL
B09DR0	A3-12-044-04B	SV	SOIL
B09DR0	A3-12-044-04F	K	SOIL
B09DR3	A3-12-044-05A	V	SOIL
B09DR3	A3-12-044-05B	SV	SOIL
B09DR3	A3-12-044-05E	K	SOIL
B09DR3 MS	A3-12-044-05F	K	SOIL
B09DR3 MSD	A3-12-044-05G	K	SOIL
B09DR1	A3-12-044-06A	V	SOIL
B09DR1	A3-12-044-06B	SV	SOIL
B09DR1	A3-12-044-06D	K	SOIL
B09DR2	A3-12-044-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

Hexane was detected as a TIC (tentatively identified compound) in samples B09DR1, B09DR2, and the blank, VBLK1223R.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DQ8, B09DQ9, and B09DR0. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR0MS and B09DR0MSD were within the QC limits.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the samples B09DQ8, B09DQ8MS, and B09DQ8MSD, were concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the same samples were performed by the analyst prior to injection. For sample B09DR0, a 1:20 dilution was performed by the analyst prior to

injection. The large dilutions were necessary based on the viscous nature of the extracts.

The matrix spikes and surrogates were not recoverable for samples B09DQ8, B09DQ8MS, and B09DQ8MSD, due to the large dilutions. The blank, SBLK1223S2, and samples B09DQ7, B09DQ9, B09DR1, and B09DR3, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits. For sample B09DR0, all of the surrogates were diluted out, with the exception of 2-Fluorobiphenyl, Terphenyl-d14, and 1,2-Dichlorobenzene-d4; 2-Chlorophenol-d4 was not diluted out, although the recoveries were still below the QC limits.

In samples B09DQ7, B09DQ9, B09DR1, B09DR3, and SBLK1223S2, the compound 4-Hydroxy-4-methyl-2-pentanone was detected as a Aldol condensation TIC, and therefore "A" qualified. There were several other TICs detected in each sample. In addition, both Diethylphthalate and Di-n-butylphthalate were detected below the CRQL in samples B09DQ7, B09DQ9, B09DR1, B09DR3, and in the blank. In all of the samples, with the exception of sample B09DQ7, the compound Phosphoric Acid Tributyl Ester was detected as a TIC and "N" qualified.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 950ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

A 1:50 dilution of samples B09DQ8, B09DQ9, and B09DR0, was performed in order to bring the results within the linear range of the instrument. Sample B09DR3 was spiked with Kerosene. The matrix spike recoveries ranged from 67% to 68%.

The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth

Nicole Roth 2/23/94
Program Manager

Maureen Parrish

Maureen Parrish 2/22/94
Project Manager

000079

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-051

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 22, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DR4	A3-12-051-01A	V	SOIL
B09DR4 MS	A3-12-051-01B	V	SOIL
B09DR4 MSD	A3-12-051-01C	V	SOIL
B09DR4	A3-12-051-01D	SV	SOIL
B09DR4	A3-12-051-01G	K	SOIL
B09DR5	A3-12-051-02A	V	SOIL
B09DR5 MS	A3-12-051-02H	V	SOIL
B09DR5 MSD	A3-12-051-02I	V	SOIL
B09DR5	A3-12-051-02B	SV	SOIL
B09DR5 MS	A3-12-051-02C	SV	SOIL
B09DR5 MSD	A3-12-051-02D	SV	SOIL
B09DR5	A3-12-051-02G	K	SOIL
B09DR6	A3-12-051-03A	V	SOIL
B09DR6	A3-12-051-03B	SV	SOIL
B09DR6	A3-12-051-03D	K	SOIL
B09DR6 MS	A3-12-051-03E	K	SOIL
B09DR6 MSD	A3-12-051-03F	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed, with the required QC, by heated purge within the CLP SOW holding times.

051

The analyte Toluene was detected below the CRQL in samples B09DR4, B09DR6, and the blank, VBLK1229R. In addition, Hexane was detected as a TIC (tentatively identified compound) in samples B09DR4 and B09DR6.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed, with the required QC, within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DR5, B09DR5MS, and B09DR5MSD. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR5MS and B09DR5MSD were within the QC limits. The surrogate 1,2-Dichloroethane-d4 had a recovery above the QC limits in sample B09DR5MSD.

All of the other QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In samples B09DR4, B09DR5, B09DR6, and B09DR5MSD, Diethylphthalate, Di-n-butylphthalate, and bis(2-Ethylhexyl)phthalate were detected at concentrations less than the CRQL. Only Diethylphthalate and Di-n-butylphthalate were detected in sample B09DR5MS and in the blank, SBLK1229S2, below the CRQL.

The matrix spikes recoveries for 4-Nitrophenol were below the QC limits in samples B09DR5MS and B09DR5MSD. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

Kerosene was detected in samples B09DR5 and B09DR6. Sample B09DR6 was spiked with Kerosene, and the matrix spike recoveries were 71% for the MS, and 57% for the MSD. The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 2/23/94
Nicole Roth
Program Manager

Maureen Parrish 2/22/94
Maureen Parrish
Project Manager

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-03-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322291 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml GW:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-03-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Karen E. Rogers 12-07-93	J.D. Fowler J.D. Fowler	12/7/93 1309
Relinquished by: 12/7/93 J.D. Fowler J.D. Fowler 1335	Received by: H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1213

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-06-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 997332291

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-06-93

~~3)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Joseph Rogers 12-7-93	J.D. Fankhr J.D. Fankhr	12/7/93 1305
Relinquished by: J.D. Fankhr J.D. Fankhr 12/7/93 1335	Received by: [illegible] 326/H. NARCISO	Date/Time: 12-08-93 1:00 P.M
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1214

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-09-93

Ice Chest No.: SML-437 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-09-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Lorene E. Rogers 0950	[signature]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

056

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1215

~~000002G~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Karen E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NorCal 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

L057

9213512.1216

~~0000027~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ8

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0945 Doreen E Rogers 12-17-93	K. Blum Kermit Blum	12.20.93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12.20.93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713512.1217

000002 H

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No. — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No. — Offsite Property No.

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ9

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR0

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml ~~P:CLP;TAL~~ Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

JEP 12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Lorene E. Page 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713512.1218

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-15-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

~~3) B09~~

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-14-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Loren E. Rogers 12-17-93 1200	W. V. Selzer	12-17-93 1200
W. V. Selzer	Ramirez	12-20-93 8:00

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Rec'd SATURDAY BUT opened 12-20-93 12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1219

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No. — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No. — Offsite Property No.

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) 209DR3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1220

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 6/16/93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8217 — Offsite Property No.: IW94-0-0138#39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DR4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 Florence Rogers 0845	W.V. Selyer	12.21.93 0846
Relinquished by: W.V. Selyer	Received by: Ramirez	Date/Time: 12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1221

~~F000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Fanh

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML-410 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) BOYDRS

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/16/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Steven E. Rogers 12-21-93	Kenise	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1222

~~000002E~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-20-93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217 — Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-20-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845	W.V. Seltzer	12-21-93 0846
W.V. Seltzer	[illegible]	12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

064

9713517.1223

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9713517.1224

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09D26-TMA-681
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/01/94
CASE:		SDG: B09D26-TMA-681

ANALYSES PERFORMED

☒ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09D99
B09D00
B09D01

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

066

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: MeCl2 is detected in the lab blank assoc w/ B09DQ1.

Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B-9D06-TMA-681

SDG:	VALIDATOR:	DATE: 4/01/94	PAGE 1 OF 1
COMMENTS: Volatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B-9DP9	VOA	12/03/93		12/10/93		7	None
B-9DQ0		12/03/93		12/10/93		7	
B-9DQ1		12/06/93		12/13/93		7	

9413517.1227

9713517.1228

~~000209~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK1213R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK1213

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31213R02

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 12/13/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Assoc. w/ B09DQ1 only.

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

MLD=4C

070

FORM I VOA 4/01/94 3/90

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: 809Q6-TMA-681
VALIDATOR: [signature]	LAB: TMA	DATE: 04/01/94
CASE:		SDG: 809Q6-TMA-681

ANALYSES PERFORMED

☒ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soil

809Q6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

071

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments: CCV RRF for 1,1,2,2-TCA is <0.5. The assoc. result has been qualified as unusable (UR).

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: $MeCl_2$ is detected in the blank. The quantitation sheets are used for comparing $MeCl_2$ blank and sample concentrations. Therefore, the assoc. sample result has been qualified as undetected (U).

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

4/1/94. The sample locations are not currently available, ~~these are~~ ~~however the~~ but will be evaluated in the final summary report.

HOLDING TIME SUMMARY

B09D26-TMA-681

SDG:	VALIDATOR:	DATE: 4/01/94	PAGE 1 OF 1

COMMENTS: Volatile Organics

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D26	VOA	12/09/93		12/23/93		14	None

9213517.1234

~~000162~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK1223MM

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: MEOH1223

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 31223M03

Level: (low/med) MED Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/23/93

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: 10000 (uL) Soil Aliquot Volume: 100 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	1200	U
74-83-9	Bromomethane	1200	U
75-01-4	Vinyl Chloride	1200	U
75-00-3	Chloroethane	1200	U
75-09-2	Methylene Chloride	160	J
67-64-1	Acetone	1200	U
75-15-0	Carbon Disulfide	1200	U
75-35-4	1,1-Dichloroethene	1200	U
75-34-3	1,1-Dichloroethane	1200	U
540-59-0	1,2-Dichloroethene (total)	1200	U
67-66-3	Chloroform	1200	U
107-06-2	1,2-Dichloroethane	1200	U
78-93-3	2-Butanone	1200	U
71-55-6	1,1,1-Trichloroethane	1200	U
56-23-5	Carbon Tetrachloride	1200	U
75-27-4	Bromodichloromethane	1200	U
78-87-5	1,2-Dichloropropane	1200	U
10061-01-5	cis-1,3-Dichloropropene	1200	U
79-01-6	Trichloroethene	1200	U
124-48-1	Dibromochloromethane	1200	U
79-00-5	1,1,2-Trichloroethane	1200	U
71-43-2	Benzene	1200	U
10061-02-6	trans-1,3-Dichloropropene	1200	U
75-25-2	Bromoform	1200	U
108-10-1	4-Methyl-2-Pentanone	1200	U
591-78-6	2-Hexanone	1200	U
127-18-4	Tetrachloroethene	1200	U
79-34-5	1,1,2,2-Tetrachloroethane	1200	U
108-88-3	Toluene	1200	U
108-90-7	Chlorobenzene	1200	U
100-41-4	Ethylbenzene	1200	U
100-42-5	Styrene	1200	U
1330-20-7	Xylene (total)	1200	U

076

9713517.1235

Lab Blank

VBLK1223MM

~~000165~~

Quantitation Report File: 31223M03

Data: 31223M03.TI
12/23/93 10:24:00
Sample: CLP,,,VBLK1223MM,M,S,MEOH1223,VOA,BLANK
Conds.: CAP/.53,31223M01,3BFM1223,31223M02
Formula: 100UL/5ML Instrument: MINNIE Weight: 0.000
Submitted by: TMA-ARLI Analyst: LS/#M-06 Acct. No.: -

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name		
1	CI01	BROMOCHLOROMETHANE	*INTERNAL STANDARD*
2	CI10	1,4-DIFLUOROBENZENE	*INTERNAL STANDARD*
3	CI20	D5-CHLOROBENZENE	*INTERNAL STANDARD*
4	CS15	D4-1,2-DICHLOROETHANE	*SURROGATE*
5	CS05	D8-TOLUENE	*SURROGATE*
6	CS10	BROMOFLUOROBENZENE	*SURROGATE*
7	CO30	METHYLENE CHLORIDE	

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	561	8:05	1	1.000	A BB	38669.	50.000 NG/ML	16.29
2	114	664	9:34	2	1.000	A BB	153530.	50.000 NG/ML	16.29
3	117	1023	14:44	3	1.000	A BB	141763.	50.000 NG/ML	16.29
4	65	623	8:59	1	1.111	A BB	47222.	53.267 NG/ML	17.35
5	98	840	12:06	3	0.821	A BB	130545.	53.542 NG/ML	17.44
6	95	1175	16:56	3	1.149	A BB	119762.	48.953 NG/ML	15.95
7	84	382	5:30	1	0.681	A BB	1317.	1.244 NG/ML	0.41

Methylene chloride

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:03	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	9:33	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	14:41	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	8:57	1.00	1.111	1.00	53.27	50.00	1.221	1.146	1.07
5	12:04	1.00	0.822	1.00	53.54	50.00	0.921	0.860	1.07
6	16:51	1.01	1.147	1.00	48.95	50.00	0.845	0.863	0.98
7	5:28	1.01	0.678	1.00	1.24	50.00	0.034	1.369	0.02

$1.244 \frac{NG}{ML}$ $MeCl_2$ $\times 10 = 12.44 \frac{NG}{ML}$ $MeCl_2$

4/7/94

9713517.1236

Quantitation Report File: 31223M06

B09Q6

~~000111~~

Data: 31223M06.TI
12/23/93 12:23:00
Sample: CLP,12029,,B09DQ6DL,M,S,A312029-01A,VOA,EPA
Conds.: CAP/.53,31223M01,3BFM1223,31223M03
Formula: 4G/10ML(10UL/5ML) Instrument: MINNIE Weight: 0.000
Submitted by: TMA-ARLI Analyst: LS/#M-06 Acct. No.: -

jjh 1/26/94

AMOUNT=AREA * REF AMNT/(REF AREA * RESP FACT)
Resp. fac. from Library Entry

No	Name		
1	CI01	BROMOCHLOROMETHANE	*INTERNAL STANDARD*
2	CI10	1,4-DIFLUOROBENZENE	*INTERNAL STANDARD*
3	CI20	D5-CHLOROBENZENE	*INTERNAL STANDARD*
4	CS15	D4-1,2-DICHLOROETHANE	*SURROGATE*
5	CS05	D8-TOLUENE	*SURROGATE*
6	CS10	BROMOFLUOROBENZENE	*SURROGATE*
7	CO30	METHYLENE CHLORIDE	

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	563	8:07	1	1.000	A BB	33027.	50.000 NG/ML	16.26
2	114	666	9:36	2	1.000	A BB	140826.	50.000 NG/ML	16.26
3	117	1024	14:45	3	1.000	A BB	127632.	50.000 NG/ML	16.26
4	65	625	9:00	1	1.110	A BB	39124.	51.672 NG/ML	16.80
5	98	842	12:08	3	0.822	A BB	116164.	52.919 NG/ML	17.21
6	95	1174	16:55	3	1.146	A BB	112911.	51.263 NG/ML	16.67
7	84	384	5:32	1	0.682	A BB	1550.	1.714 NG/ML	0.56

methylene chloride

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:08	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	9:37	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	14:47	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	9:02	1.00	1.110	1.00	51.67	50.00	1.185	1.146	1.03
5	12:10	1.00	0.823	1.00	52.92	50.00	0.910	0.860	1.06
6	16:58	1.00	1.147	1.00	51.26	50.00	0.885	0.863	1.03
7	5:33	1.00	0.681	1.00	1.71	50.00	0.047	1.369	0.03

Qualifying Methylene chloride result is sample B09DQ6 as undetected (U).

4/7/94

9213517.1257

~~000151~~

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Instrument ID: MINNIE Calibration date: 12/23/93 Time: 848

Lab File ID: 31223M01 Init. Calib. Date(s): 11/29/93 11/29/93

Heated Purge: (Y/N) N Init. Calib. Times: 1545 1905

GC Column: CAP ID: 0.530 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D	
Chloromethane	0.828	0.923	0.010	-11.5		
Bromomethane	1.598	1.712	0.100	-7.1	25.0	
Vinyl Chloride	1.292	1.477	0.100	-14.3	25.0	
Chloroethane	0.836	0.792	0.010	5.3		
Methylene Chloride	1.442	1.369	0.010	5.1		
Acetone	0.221	0.143	0.010	35.3		
Carbon Disulfide	3.487	3.412	0.010	2.2		
1,1-Dichloroethene	1.304	1.442	0.100	-10.6	25.0	
1,1-Dichloroethane	2.716	2.687	0.200	1.1	25.0	
1,2-Dichloroethene (total)	1.515	1.523	0.010	-0.5		
Chloroform	3.321	3.133	0.200	5.7	25.0	
1,2-Dichloroethane	2.007	1.813	0.100	9.7	25.0	
2-Butanone	0.373	0.245	0.010	34.3		
1,1,1-Trichloroethane	0.686	0.670	0.100	2.3	25.0	
Carbon Tetrachloride	0.718	0.688	0.100	4.2	25.0	
Bromodichloromethane	0.741	0.663	0.200	10.5	25.0	
1,2-Dichloropropane	0.382	0.360	0.010	5.8		
cis-1,3-Dichloropropene	0.550	0.502	0.200	8.7	25.0	
Trichloroethene	0.494	0.489	0.300	1.0	25.0	
Dibromochloromethane	0.795	0.693	0.100	12.8	25.0	
1,1,2-Trichloroethane	0.364	0.309	0.100	15.1	25.0	
Benzene	0.813	0.830	0.500	-2.1	25.0	
trans-1,3-Dichloropropene	0.493	0.423	0.100	14.2	25.0	
Bromoform	0.598	0.470	0.100	21.4	25.0	
4-Methyl-2-Pentanone	0.289	0.248	0.010	14.2		
2-Hexanone	0.154	0.103	0.010	33.1		
Tetrachloroethene	0.494	0.486	0.200	1.6	25.0	
1,1,2,2-Tetrachloroethane	0.580	0.435	0.500	25.0	25.0	UR
Toluene	1.052	1.014	0.400	3.6	25.0	
Chlorobenzene	0.996	0.946	0.500	5.0	25.0	
Ethylbenzene	0.438	0.381	0.100	13.0	25.0	
Styrene	0.891	0.797	0.300	10.6	25.0	
Xylene (total)	0.549	0.507	0.300	7.6	25.0	
Toluene-d8	0.984	0.860	0.010	12.6		
Bromofluorobenzene	0.822	0.863	0.200	-5.0	25.0	
1,2-Dichloroethane-d4	1.517	1.146	0.010	24.5		

All other compounds must meet a minimum RRF of 0.010.

4/01/94

FORM VII VOA

3/90

079

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B09Q6-TMA-681	
VALIDATOR: [illegible]	LAB: TMA	DATE: 03/30/94
CASE:	SDG: B09Q6-TMA-681	

ANALYSES PERFORMED

☒ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09Q7	B09R2
B09Q8	B09R3
B09Q9	
B09R0	
B09R1	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

080

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments: CCV RRF for 1,1,2,2-Tetrachloroethane was < 0.5. The assoc. sample results, B09DR0, B09DQ9, & B09DQ8, have been qualified as unusable (UR).

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available, however, will be evaluated in the final summary report.

- MeCl2 & acetone were detected in 2 of 3 of the assoc lab blanks. Results have been qualified as undetected (U) accordingly.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . (Yes) No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)

Are field split RPD values acceptable? . . . . . Yes No (N/A)

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . (Yes) No N/A

Are internal standard areas acceptable? . . . . . (Yes) No N/A

Are internal standard retention times acceptable? . . . . . (Yes) No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . (Yes) No N/A

Is compound quantitation acceptable? . . . . . (Yes) No N/A

Comments: Samples B09DQ9, B09DQ8, and B09DR0 were analyzed as medium level soils due to high concentrations of TICs. Low level analysis reports for these 3 samples were not provided. All TCL constituents are ND for these 3 samples. Typically DL are higher than normal.

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are all results supported in the raw data? . . . . . (Yes) No N/A

Do results meet the CRQLs? . . . . . (Yes) No N/A

Has the laboratory properly identified and coded all TIC? . . (Yes) No N/A

Comments: The dilution factors ~~reported~~ for samples B09DQ9 and B09DR0 were reported incorrectly as 0.2 and have been corrected to 0.1. A calculation summary sheet follows. No qualification of the data was required.

082

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Chloromethane was detected in the blank associated with sample B09DR2, the blank conc was <1 ug/kg and therefore was not reported. The chloromethane result in sample B09DR2 has been qualified as undetected (U).

4/4/94

HOLDING TIME SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR:	DATE: 3/30/94	PAGE 1 OF 1
COMMENTS: Volatiles			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED (1) 3/30/94	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09Q7	VOA	12/13/93		12/23/~~94~~93		10	None
B09Q8		12/13/93		12/24/93		11	
B09Q9		12/14/93		12/24/93		10	
B09R0		12/14/93		12/24/93		10	
B09R1		12/15/93		12/23/93		8	
B09R2		12/15/93		12/23/93		8	
B09R3		12/14/93		12/24/93		10	

9213512.1243

7A
VOLATILE CONTINUING CALIBRATION CHECK

~~000321~~

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Instrument ID: MINNIE Calibration date: 12/24/93 Time: 856

Lab File ID: 31224M02 Init. Calib. Date(s): 11/29/93 11/29/93

Heated Purge: (Y/N) N Init. Calib. Times: 1545 1905

GC Column: CAP ID: 0.530 (mm)

Assoc. w/ B09DR0, B09DQ9, B09DQ8

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D	
Chloromethane	0.828	0.980	0.010	-18.4		
Bromomethane	1.598	1.815	0.100	-13.6	25.0	
Vinyl Chloride	1.292	1.530	0.100	-18.4	25.0	
Chloroethane	0.836	0.817	0.010	2.3		
Methylene Chloride	1.442	1.320	0.010	8.5		
Acetone	0.221	0.148	0.010	33.0		
Carbon Disulfide	3.487	3.399	0.010	2.5		
1,1-Dichloroethene	1.304	1.366	0.100	-4.8	25.0	
1,1-Dichloroethane	2.716	2.717	0.200	0.0	25.0	
1,2-Dichloroethene (total)	1.515	1.496	0.010	1.3		
Chloroform	3.321	3.143	0.200	5.4	25.0	
1,2-Dichloroethane	2.007	1.826	0.100	9.0	25.0	
2-Butanone	0.373	0.272	0.010	27.1		
1,1,1-Trichloroethane	0.686	0.678	0.100	1.2	25.0	
Carbon Tetrachloride	0.718	0.697	0.100	2.9	25.0	
Bromodichloromethane	0.741	0.693	0.200	6.5	25.0	
1,2-Dichloropropane	0.382	0.378	0.010	1.0		
cis-1,3-Dichloropropene	0.550	0.527	0.200	4.2	25.0	
Trichloroethene	0.494	0.478	0.300	3.2	25.0	
Dibromochloromethane	0.795	0.733	0.100	7.8	25.0	
1,1,2-Trichloroethane	0.364	0.326	0.100	10.4	25.0	
Benzene	0.813	0.820	0.500	-0.9	25.0	
trans-1,3-Dichloropropene	0.493	0.448	0.100	9.1	25.0	
Bromoform	0.598	0.525	0.100	12.2	25.0	
4-Methyl-2-Pentanone	0.289	0.287	0.010	0.7		
2-Hexanone	0.154	0.116	0.010	24.7		
Tetrachloroethene	0.494	0.492	0.200	0.4	25.0	
1,1,2,2-Tetrachloroethane	0.580	0.464	0.500	20.0	25.0	UR
Toluene	1.052	0.996	0.400	5.3	25.0	
Chlorobenzene	0.996	0.916	0.500	8.0	25.0	
Ethylbenzene	0.438	0.400	0.100	8.7	25.0	
Styrene	0.891	0.804	0.300	9.8	25.0	
Xylene (total)	0.549	0.498	0.300	9.3	25.0	
Toluene-d8	0.984	0.950	0.010	3.5		
Bromofluorobenzene	0.822	0.949	0.200	-15.4	25.0	
1,2-Dichloroethane-d4	1.517	1.272	0.010	16.2		

All other compounds must meet a minimum RRF of 0.010.

FORM VII VOA 3/30/94

3/90

085

9213517.1244

~~000126~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK1223R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK1223

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Assoc. w/ B091027, & B091DR1 & B091DR2

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	J x10=30
67-64-1	Acetone	5	J x10=50
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

086

FORM I VOA 3/30/94 3/90

9213512.1245

~~000127~~

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK1223R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK1223

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31223R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 12/23/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-54-3	HEXANE	15.75	6	JN x5=30

L087

9213512.1246

Blank Quant. Sheet
Assoc. w/ BO4082.

VBLK1223R
chloromethane

~~000351~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	202	8:25	1	1.000	A BV	40514.	50.000 PPB	15.95
2	114	398	16:35	2	1.000	A BB	183543.	50.000 PPB	15.95
3	117	493	20:32	3	1.000	A BB	159111.	50.000 PPB	15.95
4	65	255	10:37	1	1.262	A BB	65952.	45.549 PPB	14.53
5	98	469	19:32	3	0.951	A BB	173415.	51.766 PPB	16.52
6	95	578	24:05	3	1.172	A BB	120063.	50.180 PPB	16.01
~~7~~	~~50~~	~~26~~	~~1:05~~	~~1~~	~~0.129~~	~~A BV~~	~~1593.~~	~~0.790 PPB~~	~~0.25~~
~~8~~	~~94~~	~~47~~	~~1:57~~	~~1~~	~~0.233~~	~~A BB~~	~~603.~~	~~0.405 PPB~~	~~0.13~~
9	NOT FOUND								
10	NOT FOUND								
11	84	135	5:37	1	0.668	A VB	4065.	2.771 PPB	0.88
12	43	150	6:15	1	0.743	A BV	3913.	4.741 PPB	1.51
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
~~17~~	~~83~~	~~243~~	~~10:07~~	~~1~~	~~1.203~~	~~A BB~~	~~524.~~	~~0.190 PPB~~	~~0.06~~
~~18~~	~~43~~	~~256~~	~~10:40~~	~~1~~	~~1.267~~	~~A BB~~	~~1784.~~	~~1.671 PPB~~	~~0.53~~
19	NOT FOUND								
~~20~~	~~97~~	~~283~~	~~11:47~~	~~2~~	~~0.711~~	~~A BB~~	~~650.~~	~~0.342 PPB~~	~~0.11~~
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
~~28~~	~~78~~	~~351~~	~~14:37~~	~~2~~	~~0.882~~	~~A BB~~	~~2263.~~	~~0.553 PPB~~	~~0.18~~
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
~~33~~	~~43~~	~~413~~	~~17:12~~	~~3~~	~~0.838~~	~~A BB~~	~~711.~~	~~0.286 PPB~~	~~0.09~~
~~34~~	~~43~~	~~443~~	~~18:27~~	~~3~~	~~0.899~~	~~A BB~~	~~516.~~	~~0.275 PPB~~	~~0.09~~
35	NOT FOUND								
~~36~~	~~164~~	~~449~~	~~18:42~~	~~3~~	~~0.911~~	~~A BB~~	~~510.~~	~~0.419 PPB~~	~~0.13~~
~~37~~	~~91~~	~~473~~	~~19:42~~	~~3~~	~~0.959~~	~~A BB~~	~~3949.~~	~~0.972 PPB~~	~~0.31~~
~~38~~	~~112~~	~~495~~	~~20:37~~	~~3~~	~~1.004~~	~~A VB~~	~~640.~~	~~0.197 PPB~~	~~0.06~~
39	NOT FOUND								
~~40~~	~~104~~	~~604~~	~~25:10~~	~~3~~	~~1.225~~	~~A BB~~	~~505.~~	~~0.151 PPB~~	~~0.05~~
~~41~~	~~106~~	~~608~~	~~25:20~~	~~3~~	~~1.233~~	~~A BB~~	~~1428.~~	~~0.789 PPB~~	~~0.25~~
~~42~~	~~106~~	~~629~~	~~26:12~~	~~3~~	~~1.276~~	~~A BB~~	~~1528.~~	~~0.844 PPB~~	~~0.27~~

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:25	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:37	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:32	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:37	1.00	1.262	1.00	45.55	50.00	1.628	1.787	0.91
5	19:32	1.00	0.951	1.00	51.77	50.00	1.090	1.053	1.04
6	24:05	1.00	1.172	1.00	50.18	50.00	0.755	0.752	1.00
7	1:10	0.93	0.139	0.93	0.79	50.00	0.039	2.487	0.02
8	2:05	0.94	0.248	0.94	0.40	50.00	0.015	1.839	0.01
9	2:42		0.322						
10	3:47		0.450						
11	5:42	0.99	0.678	0.99	2.77	50.00	0.100	1.811	0.06
12	6:27	0.97	0.767	0.97	4.74	50.00	0.097	1.018	0.09

12-29-93

088

4/4/94 01/06/94

9213517.1247

~~000129~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK1224R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK1224

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31224R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 12/24/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Assoc w/ B090R3

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	J x10=10
67-64-1	Acetone	3	J x10=30
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

·089

CALCULATION SUMMARY

B09D06-TMA-681

SDG:	REVIEWER:	DATE: 3/30/94	PAGE 1 OF 1

3/30/94

COMMENTS: Volatile Medium Level ~~Volatile~~ Dilution Factor Calculation.

Dilution Factor = Amount of Methanol extract ~~used~~ taken for screening and analysis / Amount of methanol added to intact sample for extraction.

B09D09 Dilution Factor = 1000 uL / 10000 uL = 0.1

B09D0 Dilution Factor = 1000 uL / 10000 uL = 0.1

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B09D26-TMA-681	
VALIDATOR: [illegible]	LAB: TMA	DATE: 03/29/94
CASE:	SDG: B09D26-TMA-681	

ANALYSES PERFORMED

☒ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B09DR4 Soil
B09DR5
B09DR6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

091

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:
RRF for 1,1,2,2-Tetrachloroethane was <0.500 in the CCV assoc. w/ sample B09DR5. The assoc results has been qualified as unusable (UR).

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: - Sample locations are not currently available, however, will be evaluated in the final summary report.
- Methylene chloride, acetone, and toluene were detected in the laboratory blanks resulting in qualification of associated data as undetected (U).

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A
Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
Were MS/MSD samples analyzed? . . . . . Yes No N/A
Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments:
The surrogate recovery for 1,2-dichloroethane-d4 in sample B09DR5MSD was greater than the upper control limit. No qualification was required since assoc. samples are not affected. The MSD is a required QC sample only. All other surrogate recoveries are acceptable.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A
Are internal standard areas acceptable? . . . . . Yes No N/A
Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A
Is compound quantitation acceptable? . . . . . Yes No N/A

Comments: Sample B=9QR5 was analyzed as a medium level soil due to high concentration of TICs - therefore the DL are higher than normal. All TCLs are reported as Nondetects. Data for a low level sample run for B=9QR5 was not provided in this pkg.

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Do results meet the CRQLs? . . . . . Yes No N/A
Has the laboratory properly identified and coded all TIC? . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR:	DATE: 3/30/94	PAGE 1 OF 1
COMMENTS: Volatiles			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DR4	VOA	12/16/93		12/29/93		~~15~~ 13	None
B09DR5	↓	12/16/93		12/30/93		14	↓
B09DR6	↓	12/20/93		12/29/93		9	↓
						9/4/94	

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9713517.1253

7A
VOLATILE CONTINUING CALIBRATION CHECK

~~000230~~

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Instrument ID: MINNIE Calibration date: 12/30/93 Time: 919

Lab File ID: 31230M01 Init. Calib. Date(s): 11/29/93 11/29/93

Heated Purge: (Y/N) N Init. Calib. Times: 1545 1905

GC Column: CAP ID: 0.530 (mm)

Assoc w/ B09DR5, B09DR5MS & B09DR5MSD.

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D	
Chloromethane	0.828	0.921	0.010	-11.2		
Bromomethane	1.598	1.804	0.100	-12.9	25.0	
Vinyl Chloride	1.292	1.495	0.100	-15.7	25.0	
Chloroethane	0.836	0.840	0.010	-0.5		
Methylene Chloride	1.442	1.437	0.010	0.3		
Acetone	0.221	0.181	0.010	18.1		
Carbon Disulfide	3.487	3.986	0.010	-14.3		
1,1-Dichloroethene	1.304	1.567	0.100	-20.2	25.0	
1,1-Dichloroethane	2.716	2.922	0.200	-7.6	25.0	
1,2-Dichloroethene (total)	1.515	1.628	0.010	-7.5		
Chloroform	3.321	3.354	0.200	-1.0	25.0	
1,2-Dichloroethane	2.007	1.825	0.100	9.1	25.0	
2-Butanone	0.373	0.313	0.010	16.1		
1,1,1-Trichloroethane	0.686	0.733	0.100	-6.9	25.0	
Carbon Tetrachloride	0.718	0.744	0.100	-3.6	25.0	
Bromodichloromethane	0.741	0.662	0.200	10.7	25.0	
1,2-Dichloropropane	0.382	0.352	0.010	7.9		
cis-1,3-Dichloropropene	0.550	0.501	0.200	8.9	25.0	
Trichloroethene	0.494	0.504	0.300	-2.0	25.0	
Dibromochloromethane	0.795	0.694	0.100	12.7	25.0	
1,1,2-Trichloroethane	0.364	0.307	0.100	15.7	25.0	
Benzene	0.813	0.828	0.500	-1.8	25.0	
trans-1,3-Dichloropropene	0.493	0.418	0.100	15.2	25.0	
Bromoform	0.598	0.505	0.100	15.6	25.0	
4-Methyl-2-Pentanone	0.289	0.285	0.010	1.4		
2-Hexanone	0.154	0.118	0.010	23.4		
Tetrachloroethene	0.494	0.535	0.200	-8.3	25.0	
1,1,2,2-Tetrachloroethane	0.580	0.461	0.500	20.5	25.0	UR
Toluene	1.052	1.044	0.400	0.8	25.0	
Chlorobenzene	0.996	0.924	0.500	7.2	25.0	
Ethylbenzene	0.438	0.399	0.100	8.9	25.0	
Styrene	0.891	0.808	0.300	9.3	25.0	
Xylene (total)	0.549	0.529	0.300	3.6	25.0	
Toluene-d8	0.984	0.880	0.010	10.6		
Bromofluorobenzene	0.822	0.826	0.200	-0.5	25.0	
1,2-Dichloroethane-d4	1.517	1.124	0.010	25.9		

All other compounds must meet a minimum RRF of 0.010.

3/30/94

FORM VII VOA

3/90

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~~000105~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK1229R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK1229

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31229R03

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 12/29/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

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

Assoc. w/ B09DR4 & B09DR6.

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	J HQ=20
67-64-1	Acetone	4	J HQ=40
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	1	J HQ=10
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

'096

FORM I VOA 3/30/94 3/90

9713517.1255

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 7, 1994

FR: Susan Winter, Golder Associates Inc.

RE: SEMIVOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DQ6-TMA-681 (923-E418, Filename B09DQ6.BNA)

INTRODUCTION

This memo presents the results of data validation on data package B09DQ6-TMA-681 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DQ0	12/03/93	SOIL	SEE NOTE 1
B09DQ1	12/06/93	SOIL	
B09DQ6	12/09/93	SOIL	
B09DQ7	12/13/93	SOIL	
B09DQ8	12/13/93	SOIL	
B09DQ9	12/14/92	SOIL	
B09DR0	12/14/93	SOIL	
B09DR1	12/15/93	SOIL	
B09DR3	12/14/93	SOIL	
B09DR4	12/16/93	SOIL	
B09DR5	12/16/93	SOIL	
B09DR6	12/20/93	SOIL	
Note 1. All samples were analyzed for CLP TCL semivolatile organics.			

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION SDLA

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiencies identified below.

001

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method. Samples B09DQ6, B09DQ8, and B09DR0 were analyzed at various dilutions due to the extreme viscosity of the sample extracts and the presence of tentatively identified compounds (TIC) at high concentrations. Therefore, the reported detection limits for the indicated samples reflect this dilution.

Completeness. The data package was complete for all requested analyses. A total of twelve samples were validated in this data package with a total of 768 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data as estimated.

Laboratory Blanks

- Diethylphthalate and di-n-butylphthalate were detected in the associated laboratory blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Matrix Spike

- Matrix spike and matrix spike duplicate percent recoveries (MS/MSD %R) for 2-nitrophenol were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the samples and associated laboratory blank and were common laboratory contaminants, resulting in qualification of the TICs as unusable (UR) as shown in Attachment 3.

- TICs were detected in the blank and identified as common laboratory contaminants, resulting in qualification of the results as unusable (R) as shown in Attachment 5.

- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

9713517.1258

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.1260

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR:	DATE: April 5, 1994	PAGE 1 OF 1
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
DIETHYLPHTHALATE	U	B09DQ7 B09DQ9 B09DR1 B09DR3 B09DR4 B09DR5 B09DR6	PRESENT IN BLANK
DI-N-BUTYLPHTHALATE	U	B09DQ0 B09DQ1 B09DQ7 B09DQ9 B09DR1 B09DR3 B09DR4 B09DR5 B09DR6	PRESENT IN BLANK
2-NITROPHENOL	UJ	B09DR4 B09DR5 B09DR6	4-NITROPHENOL MS/MSD %R < LOWER CONTROL LIMIT
2,4-DINITROPHENOL	UJ	B09DR4 B09DR5 B09DR6	4-NITROPHENOL MS/MSD %R < LOWER CONTROL LIMIT
4-NITROPHENOL	UJ	B09DR4 B09DR5 B09DR6	4-NITROPHENOL MS/MSD %R < LOWER CONTROL LIMIT

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ0		B09DQ1		B09DQ6		B09DQ7		B09DQ8		B09DQ9	
	Date	12-3-93		12-6-93		12-9-93		12-13-93		12-13-93		12-14-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2-CHLOROPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
1,3-DICHLOROBENZENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
1,4-DICHLOROBENZENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
1,2-DICHLOROBENZENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2-METHYLPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
4-METHYLPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
HEXACHLOROETHANE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
NITROBENZENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
ISOPHORONE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2-NITROPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,4-DIMETHYLPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,4-DICHLOROPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
NAPHTHALENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
4-CHLOROANILINE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
HEXACHLOROBUTADIENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2-METHYLNAPHTHALENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
2-CHLORONAPHTHALENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2-NITROANILINE	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
DIMETHYLPHTHALATE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
ACENAPHTHYLENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
3-NITROANILINE	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
ACENAPHTHENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U

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4/5/94

97357.1263

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ0		B09DQ1		B09DQ6		B09DQ7		B09DQ8		B09DQ9	
	Date	12-3-93		12-6-93		12-9-93		12-13-93		12-13-93		12-14-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
4-NITROPHENOL	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
DIBENZOFURAN	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,4-DINITROTOLUENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
FLUORENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
4-NITROANILINE	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
PENTACHLOROPHENOL	UG/KG	840.000	U	830.000	U	69000.000	U	810.000	U	71000.000	U	810.000	U
PHENANTHRENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
ANTHRACENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
CARBAZOLE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
DI-N-BUTYLPHTHALATE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
FLUORANTHENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
PYRENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
CHRYSENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BENZO(A)PYRENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	340.000	U	29000.000	U	330.000	U	29000.000	U	330.000	U

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4/5/94

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DR0		B09DR1		B09DR3		B09DR4		B09DR5		B09DR6	
	Date	12-14-93		12-15-93		12-14-93		12-16-93		12-16-93		12-20-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2-CHLOROPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
1,3-DICHLOROBENZENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
1,4-DICHLOROBENZENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
1,2-DICHLOROBENZENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2-METHYLPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
4-METHYLPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
HEXACHLOROETHANE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
NITROBENZENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
ISOPHORONE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2-NITROPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	UJ	340.000	UJ	350.000	UJ
2,4-DIMETHYLPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2,4-DICHLOROPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
NAPHTHALENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
4-CHLOROANILINE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
HEXACHLOROBUTADIENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2-METHYLNAPHTHALENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	U	820.000	U	850.000	U
2-CHLORONAPHTHALENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2-NITROANILINE	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	U	820.000	U	850.000	U
DIMETHYLPHTHALATE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
ACENAPHTHYLENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
3-NITROANILINE	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	U	820.000	U	850.000	U
ACENAPHTHENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U

Verified

4/5/94

97357.1265

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DR0		B09DR1		B09DR3		B09DR4		B09DR5		B09DR6	
	Date	12-14-93		12-15-93		12-14-93		12-16-93		12-16-93		12-20-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROPHENOL	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	UJ	820.000	UJ	850.000	UJ
4-NITROPHENOL	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	UJ	820.000	UJ	850.000	UJ
DIBENZOFURAN	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2,4-DINITROTOLUENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
2,6-DINITROTOLUENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
DIETHYLPHTHALATE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
FLUORENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
4-NITROANILINE	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	U	820.000	U	850.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	U	820.000	U	850.000	U
N-NITROSODIPHENYLAMINE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
HEXACHLOROBENZENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
PENTACHLOROPHENOL	UG/KG	16000.000	U	820.000	U	800.000	U	800.000	U	820.000	U	850.000	U
PHENANTHRENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
ANTHRACENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
CARBAZOLE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
DI-N-BUTYLPHTHALATE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
FLUORANTHENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
PYRENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BUTYLBENZYLPHTHALATE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BENZO(A)ANTHRACENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	6800.000	U	110.000	J	330.000	U	160.000	J	120.000	J	100.000	J
CHRYSENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
DI-N-OCTYLPHTHALATE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BENZO(B)FLUORANTHENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BENZO(K)FLUORANTHENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BENZO(A)PYRENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U
BENZO(G,H,I)PERYLENE	UG/KG	6800.000	U	340.000	U	330.000	U	330.000	U	340.000	U	350.000	U

Verified
4/5/94

93 7551 1266

9213512.1267

~~000242~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31220S05

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	840	U

013

Verified 4/4/94

9213517.1268

~~000243~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31220S05

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	840	U	
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350	U	
7005-72-3	4-Chlorophenyl-phenylether	350	U	
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	840	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	350 ~~110~~	~~BJ~~	U
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350	U	
85-68-7	Butylbenzylphthalate	350	U	
91-94-1	3,3'-Dichlorobenzidine	350	U	
56-55-3	Benzo(a)Anthracene	350	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U	
218-01-9	Chrysene	350	U	
117-84-0	Di-n-Octyl Phthalate	350	U	
205-99-2	Benzo(b)Fluoranthene	350	U	
207-08-9	Benzo(k)Fluoranthene	350	U	
50-32-8	Benzo(a)Pyrene	350	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U	
53-70-3	Dibenz(a,h)Anthracene	350	U	
191-24-2	Benzo(g,h,i)Perylene	350	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/4/94

FORM I SV-2 3/90

014

9213517.1269

000244

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-02B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31220S05

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.4

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	6.53	4400	~~BJ~~	USN
2.	UNKNOWN HYDROCARBON	6.88	380	~~BJ~~	USN
3.	UNKNOWN HYDROCARBON	7.85	560	~~BJ~~	USN
4.	UNKNOWN ALCOHOL	8.23	700	~~BJ~~	USN
5.	PROPANOIC ACID ESTER ISOMER	17.17	100	~~J~~	SN
6.	UNKNOWN HYDROCARBON	22.78	70	~~BJ~~	USN
7.	UNKNOWN HYDROCARBON	23.17	100	~~BJ~~	USN
8.	HEXANEDIOIC ACID ESTER ISOME	25.30	280	~~BJ~~	USN
9.	UNKNOWN ALKANE	27.93	140	~~J~~	SN
10.	UNKNOWN ALKANE	30.27	380	~~J~~	SN

015

Verified [signature] 4/4/94

9713517.1270

~~000268~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03B

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 31220S08

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	340	U	
111-44-4	bis(2-Chloroethyl)Ether	340	U	
95-57-8	2-Chlorophenol	340	U	
541-73-1	1,3-Dichlorobenzene	340	U	
106-46-7	1,4-Dichlorobenzene	340	U	
95-50-1	1,2-Dichlorobenzene	340	U	
95-48-7	2-Methylphenol	340	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U	
106-44-5	4-Methylphenol	340	U	
621-64-7	N-Nitroso-Di-n-Propylamine	340	U	
67-72-1	Hexachloroethane	340	U	
98-95-3	Nitrobenzene	340	U	
78-59-1	Isophorone	340	U	
88-75-5	2-Nitrophenol	340	U	
105-67-9	2,4-Dimethylphenol	340	U	
111-91-1	bis(2-Chloroethoxy)Methane	340	U	
120-83-2	2,4-Dichlorophenol	340	U	
120-82-1	1,2,4-Trichlorobenzene	340	U	
91-20-3	Naphthalene	340	U	
106-47-8	4-Chloroaniline	340	U	
87-68-3	Hexachlorobutadiene	340	U	
59-50-7	4-Chloro-3-Methylphenol	340	U	
91-57-6	2-Methylnaphthalene	340	U	
77-47-4	Hexachlorocyclopentadiene	340	U	
88-06-2	2,4,6-Trichlorophenol	340	U	
95-95-4	2,4,5-Trichlorophenol	830	U	
91-58-7	2-Chloronaphthalene	340	U	
88-74-4	2-Nitroaniline	830	U	
131-11-3	Dimethylphthalate	340	U	
208-96-8	Acenaphthylene	340	U	
99-09-2	3-Nitroaniline	830	U	
83-32-9	Acenaphthene	340	U	
51-28-5	2,4-Dinitrophenol	830	U	

016

Verified 4/4/94

9213512.1271

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03B

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 31220S08

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	830	U	
132-64-9	Dibenzofuran	340	U	
121-14-2	2,4-Dinitrotoluene	340	U	
606-20-2	2,6-Dinitrotoluene	340	U	
84-66-2	Diethylphthalate	340	U	
7005-72-3	4-Chlorophenyl-phenylether	340	U	
86-73-7	Fluorene	340	U	
100-01-6	4-Nitroaniline	830	U	
534-52-1	4,6-Dinitro-2-methylphenol	830	U	
86-30-6	N-Nitrosodiphenylamine (1)	340	U	
101-55-3	4-Bromophenyl-phenylether	340	U	
118-74-1	Hexachlorobenzene	340	U	
87-86-5	Pentachlorophenol	830	U	
85-01-8	Phenanthrene	340	U	
120-12-7	Anthracene	340	U	
86-74-8	Carbazole	340 ~~340~~	U	
84-74-2	Di-n-Butylphthalate	340 ~~130~~	~~BJ~~	u
206-44-0	Fluoranthene	340	U	
129-00-0	Pyrene	340	U	
85-68-7	Butylbenzylphthalate	340	U	
91-94-1	3,3'-Dichlorobenzidine	340	U	
56-55-3	Benzo(a)Anthracene	340	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U	
218-01-9	Chrysene	340	U	
117-84-0	Di-n-Octyl Phthalate	340	U	
205-99-2	Benzo(b)Fluoranthene	340	U	
207-08-9	Benzo(k)Fluoranthene	340	U	
50-32-8	Benzo(a)Pyrene	340	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U	
53-70-3	Dibenz(a,h)Anthracene	340	U	
191-24-2	Benzo(g,h,i)Perylene	340	U	

(1) - Cannot be separated from Diphenylamine

Verified 1/4/94

FORM I SV-2 3/90

017

9213512.1272

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EPA SAMPLE NO.

B09DQ1

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-03B

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 31220S08

Level: (low/med) LOW Date Received: 12/08/93

% Moisture: 6 decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.2

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN HYDROCARBON	6.57	5000	~~BJ~~	NSN
2.	UNKNOWN HYDROCARBON	6.90	410	~~BJ~~	NSN
3.	UNKNOWN HYDROCARBON	7.05	100	~~BJ~~	NSN
4.	UNKNOWN HYDROCARBON	7.88	620	~~BJ~~	NSN
5.	UNKNOWN ALCOHOL	8.25	790	~~BJ~~	NSN
6.	PROPANOIC ACID ESTER ISOMER	17.18	140	~~J~~	NSN
7.	UNKNOWN HYDROCARBON	21.67	69	~~J~~	NSN
8.	HEXANEDIOIC ACID ESTER ISOME	25.32	140	~~BJ~~	NSN
9.	UNKNOWN HYDROCARBON	27.97	69	~~J~~	NSN
10.	UNKNOWN ALKANE	30.30	240	~~J~~	NSN

Verified
4/4/94

018

9213517.1273

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01D

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31228I06

Level: (low/med) LOW Date Received: 12/15/93

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/17/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 9.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	29000	U	
111-44-4	bis(2-Chloroethyl)Ether	29000	U	
95-57-8	2-Chlorophenol	29000	U	
541-73-1	1,3-Dichlorobenzene	29000	U	
106-46-7	1,4-Dichlorobenzene	29000	U	
95-50-1	1,2-Dichlorobenzene	29000	U	
95-48-7	2-Methylphenol	29000	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	29000	U	
106-44-5	4-Methylphenol	29000	U	
621-64-7	N-Nitroso-Di-n-Propylamine	29000	U	
67-72-1	Hexachloroethane	29000	U	
98-95-3	Nitrobenzene	29000	U	
78-59-1	Isophorone	29000	U	
88-75-5	2-Nitrophenol	29000	U	
105-67-9	2,4-Dimethylphenol	29000	U	
111-91-1	bis(2-Chloroethoxy)Methane	29000	U	
120-83-2	2,4-Dichlorophenol	29000	U	
120-82-1	1,2,4-Trichlorobenzene	29000	U	
91-20-3	Naphthalene	29000	U	
106-47-8	4-Chloroaniline	29000	U	
87-68-3	Hexachlorobutadiene	29000	U	
59-50-7	4-Chloro-3-Methylphenol	29000	U	
91-57-6	2-Methylnaphthalene	29000	U	
77-47-4	Hexachlorocyclopentadiene	29000	U	
88-06-2	2,4,6-Trichlorophenol	29000	U	
95-95-4	2,4,5-Trichlorophenol	69000	U	
91-58-7	2-Chloronaphthalene	29000	U	
88-74-4	2-Nitroaniline	69000	U	
131-11-3	Dimethylphthalate	29000	U	
208-96-8	Acenaphthylene	29000	U	
99-09-2	3-Nitroaniline	69000	U	
83-32-9	Acenaphthene	29000	U	
51-28-5	2,4-Dinitrophenol	69000	U	

-019

verified 4/4/94

9713512.1274

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01D

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31228I06

Level: (low/med) LOW Date Received: 12/15/93

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/17/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 9.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	69000	U
132-64-9	Dibenzofuran	29000	U
121-14-2	2,4-Dinitrotoluene	29000	U
606-20-2	2,6-Dinitrotoluene	29000	U
84-66-2	Diethylphthalate	29000	U
7005-72-3	4-Chlorophenyl-phenylether	29000	U
86-73-7	Fluorene	29000	U
100-01-6	4-Nitroaniline	69000	U
534-52-1	4,6-Dinitro-2-methylphenol	69000	U
86-30-6	N-Nitrosodiphenylamine (1)	29000	U
101-55-3	4-Bromophenyl-phenylether	29000	U
118-74-1	Hexachlorobenzene	29000	U
87-86-5	Pentachlorophenol	69000	U
85-01-8	Phenanthrene	29000	U
120-12-7	Anthracene	29000	U
86-74-8	Carbazole	29000	U
84-74-2	Di-n-Butylphthalate	29000	U
206-44-0	Fluoranthene	29000	U
129-00-0	Pyrene	29000	U
85-68-7	Butylbenzylphthalate	29000	U
91-94-1	3,3'-Dichlorobenzidine	29000	U
56-55-3	Benzo(a)Anthracene	29000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	29000	U
218-01-9	Chrysene	29000	U
117-84-0	Di-n-Octyl Phthalate	29000	U
205-99-2	Benzo(b)Fluoranthene	29000	U
207-08-9	Benzo(k)Fluoranthene	29000	U
50-32-8	Benzo(a)Pyrene	29000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	29000	U
53-70-3	Dibenz(a,h)Anthracene	29000	U
191-24-2	Benzo(g,h,i)Perylene	29000	U

(1) - Cannot be separated from Diphenylamine

Verified: 4/4/94

FORM I SV-2 3/90

020

9713512.1275

~~000198~~ ~~000198~~ 8/13/94

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12029 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312029-01D

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31228I06

Level: (low/med) LOW Date Received: 12/15/93

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/17/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/28/93

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 9.3

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN ALKANE	7.12	240000	~~J~~	N
2.	UNKNOWN ALKANE	8.88	660000	~~J~~	N
3.	UNKNOWN HYDROCARBON	9.47	270000	~~J~~	N
4.	UNKNOWN HYDROCARBON	9.55	250000	~~J~~	N
5.	UNKNOWN ALKANE	9.92	200000	~~J~~	N
6.	UNKNOWN ALKANE	10.55	1200000	~~J~~	N
7.	UNKNOWN ALKANE	10.72	810000	~~J~~	N
8.	UNKNOWN ALKENE	10.92	210000	~~J~~	N
9.	UNKNOWN CYCLIC HYDROCARBON	11.18	270000	~~J~~	N
10.	UNKNOWN HYDROCARBON	11.32	260000	~~J~~	N
11.	UNKNOWN ALCOHOL	11.48	290000	~~J~~	N
12.	UNKNOWN ALKANE	11.62	980000	~~J~~	N
13.	UNKNOWN ALKANE	12.07	1400000	~~J~~	N
14.	UNKNOWN ALKANE	12.25	240000	~~J~~	N
15.	UNKNOWN ALCOHOL	12.73	330000	~~J~~	N
16.	UNKNOWN ALKANE	13.12	630000	~~J~~	N
17.	UNKNOWN ALKANE	13.48	990000	~~J~~	N
18.	PHOSPHORIC ACID ESTER 16.64	~~18.02~~	3900000	~~J~~	N
19.	UNKNOWN ALKANE	14.27	360000	~~J~~	N
20.	UNKNOWN ALKANE	14.80	420000	~~J~~	N

8/4/94

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Verified 4/4/94

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01D

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40119S06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	810	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	810	U

Q

·022

Verified 9/4/94

9713517.1277

~~000420~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01D

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40119S06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

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

CAS NO.	COMPOUND		Q	Q
100-02-7	4-Nitrophenol	810	U	
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330 ~~77~~	~~BJ~~	U
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	810	U	
534-52-1	4,6-Dinitro-2-methylphenol	810	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	810	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~110~~	~~BJ~~	U
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U	
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/4/94

FORM I SV-2 3/90

-023

9713517.1278

~~000421~~
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DQ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-01D

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 40119S06

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.75	15000	~~BJNA~~	UB
2.	UNKNOWN HYDROCARBON	5.97	270	~~BJ~~	UJN
3.	UNKNOWN HYDROCARBON	6.43	200	~~BJ~~	UJN
4.	UNKNOWN HYDROCARBON	6.53	67	~~J~~	JN
5.	UNKNOWN HYDROCARBON	6.90	67	~~BJ~~	UJN
6.	UNKNOWN HYDROCARBON	7.05	4100	~~BJ~~	UJN
7.	UNKNOWN HYDROCARBON	7.37	570	~~J~~	JN
8.	UNKNOWN HYDROCARBON	7.55	67	~~J~~	JN
9.	UNKNOWN HYDROCARBON	8.38	610	~~BJ~~	UJN
10.	HEXANEDIOIC ACID ESTER	25.95	200	~~J~~	JN

Verified
[signature] 4/4/94

-024

9213517.1279

~~000449~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S03

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	29000	U
111-44-4	bis(2-Chloroethyl)Ether	29000	U
95-57-8	2-Chlorophenol	29000	U
541-73-1	1,3-Dichlorobenzene	29000	U
106-46-7	1,4-Dichlorobenzene	29000	U
95-50-1	1,2-Dichlorobenzene	29000	U
95-48-7	2-Methylphenol	29000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	29000	U
106-44-5	4-Methylphenol	29000	U
621-64-7	N-Nitroso-Di-n-Propylamine	29000	U
67-72-1	Hexachloroethane	29000	U
98-95-3	Nitrobenzene	29000	U
78-59-1	Isophorone	29000	U
88-75-5	2-Nitrophenol	29000	U
105-67-9	2,4-Dimethylphenol	29000	U
111-91-1	bis(2-Chloroethoxy)Methane	29000	U
120-83-2	2,4-Dichlorophenol	29000	U
120-82-1	1,2,4-Trichlorobenzene	29000	U
91-20-3	Naphthalene	29000	U
106-47-8	4-Chloroaniline	29000	U
87-68-3	Hexachlorobutadiene	29000	U
59-50-7	4-Chloro-3-Methylphenol	29000	U
91-57-6	2-Methylnaphthalene	29000	U
77-47-4	Hexachlorocyclopentadiene	29000	U
88-06-2	2,4,6-Trichlorophenol	29000	U
95-95-4	2,4,5-Trichlorophenol	71000	U
91-58-7	2-Chloronaphthalene	29000	U
88-74-4	2-Nitroaniline	71000	U
131-11-3	Dimethylphthalate	29000	U
208-96-8	Acenaphthylene	29000	U
99-09-2	3-Nitroaniline	71000	U
83-32-9	Acenaphthene	29000	U
51-28-5	2,4-Dinitrophenol	71000	U

Q

·025

Verified 4/4/94

9213517.1280

~~000450~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S03

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 8.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	71000	U
132-64-9	Dibenzofuran	29000	U
121-14-2	2,4-Dinitrotoluene	29000	U
606-20-2	2,6-Dinitrotoluene	29000	U
84-66-2	Diethylphthalate	29000	U
7005-72-3	4-Chlorophenyl-phenylether	29000	U
86-73-7	Fluorene	29000	U
100-01-6	4-Nitroaniline	71000	U
534-52-1	4,6-Dinitro-2-methylphenol	71000	U
86-30-6	N-Nitrosodiphenylamine (1)	29000	U
101-55-3	4-Bromophenyl-phenylether	29000	U
118-74-1	Hexachlorobenzene	29000	U
87-86-5	Pentachlorophenol	71000	U
85-01-8	Phenanthrene	29000	U
120-12-7	Anthracene	29000	U
86-74-8	Carbazole	29000	U
84-74-2	Di-n-Butylphthalate	29000	U
206-44-0	Fluoranthene	29000	U
129-00-0	Pyrene	29000	U
85-68-7	Butylbenzylphthalate	29000	U
91-94-1	3,3'-Dichlorobenzidine	29000	U
56-55-3	Benzo(a)Anthracene	29000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	29000	U
218-01-9	Chrysene	29000	U
117-84-0	Di-n-Octyl Phthalate	29000	U
205-99-2	Benzo(b)Fluoranthene	29000	U
207-08-9	Benzo(k)Fluoranthene	29000	U
50-32-8	Benzo(a)Pyrene	29000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	29000	U
53-70-3	Dibenz(a,h)Anthracene	29000	U
191-24-2	Benzo(g,h,i)Perylene	29000	U

Q

(1) - Cannot be separated from Diphenylamine

Verified

FORM I SV-2 4/4/94 3/90

026

9713517.1281

~~000451~~

EPA SAMPLE NO.

B09DQ8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-02B

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S03

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 10 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) Y pH: 8.1

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	11.17	120000	~~J~~	N
2.	UNKNOWN HYDROCARBON	11.52	110000	~~J~~	N
3.	UNKNOWN ALKANE	12.12	750000	~~J~~	N
4.	UNKNOWN ALKANE	12.32	570000	~~J~~	N
5.	UNKNOWN HYDROCARBON	12.63	120000	~~J~~	N
6.	UNKNOWN CYCLIC HYDROCARBON	12.88	240000	~~J~~	N
7.	UNKNOWN ALKENE	13.03	120000	~~J~~	N
8.	UNKNOWN HYDROCARBON	13.13	140000	~~J~~	N
9.	UNKNOWN ALKANE	13.25	840000	~~J~~	N
10.	UNKNOWN ALKENE	13.50	97000	~~J~~	N
11.	UNKNOWN ALKANE	13.72	980000	~~J~~	N
12.	UNKNOWN HYDROCARBON	13.83	130000	~~J~~	N
13.	UNKNOWN ALKANE	13.93	170000	~~J~~	N
14.	UNKNOWN HYDROCARBON	14.47	260000	~~J~~	N
15.	UNKNOWN ALKANE	14.63	140000	~~J~~	N
16.	UNKNOWN ALKANE	14.82	880000	~~J~~	N
17.	UNKNOWN ALKANE	15.18	1100000	~~J~~	N
18.	UNKNOWN ALKANE	16.02	620000	~~J~~	N
19.	UNKNOWN ALKANE	16.57	510000	~~J~~	N
20. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	18.43	1500000	JN	

027

Verified
4/4/94

9713512.1282

~~000486~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40119S07

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	810	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	810	U

Q

028

FORM I SV-1 3/90

Verified [illegible] 4/4/94

9413517.1283

~~000487~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40119S07

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	810	U	
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330 ~~81~~	~~BJ~~	u
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	810	U	
534-52-1	4,6-Dinitro-2-methylphenol	810	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	810	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~210~~	~~BJ~~	u
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U	
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/4/94

FORM I SV-2 3/90

9213517.1284

~~000488~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DQ9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40119S07

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.75	14000	~~BJNA~~	R
2.	UNKNOWN ALKANE	10.48	23000	~~J~~	N
3.	UNKNOWN HYDROCARBON	10.93	3700	~~J~~	N
4.	UNKNOWN HYDROCARBON	11.22	4800	~~J~~	N
5.	UNKNOWN ALKANE	11.38	4300	~~J~~	N
6.	UNKNOWN ALKANE	12.22	29000	~~J~~	N
7.	UNKNOWN ALKANE	12.42	21000	~~J~~	N
8.	UNKNOWN CYCLIC HYDROCARBON	12.95	9300	~~J~~	N
9.	UNKNOWN HYDROCARBON	13.12	4400	~~J~~	N
10.	UNKNOWN ALKANE	13.22	5500	~~J~~	N
11.	UNKNOWN ALKANE	13.35	24000	~~J~~	N
12.	UNKNOWN ALKANE	13.82	32000	~~J~~	N
13.	UNKNOWN ALKANE	14.02	6200	~~J~~	N
14.	UNKNOWN CYCLIC HYDROCARBON	14.55	12000	~~J~~	N
15.	UNKNOWN ALKANE	14.72	7700	~~J~~	N
16.	UNKNOWN ALKANE	15.28	39000	~~J~~	N
17.	UNKNOWN ALKANE	16.08	23000	~~J~~	N
18.	UNKNOWN ALKANE	16.63	22000	~~J~~	N
19.	UNKNOWN ALKANE	17.90	5500	~~J~~	N
20. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	18.62	130000	JN	

Verified [signature] 1/4/94

030

9713512.1285

~~000529~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04B

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120S08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 8.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	6800	U	
111-44-4	bis(2-Chloroethyl)Ether	6800	U	
95-57-8	2-Chlorophenol	6800	U	
541-73-1	1,3-Dichlorobenzene	6800	U	
106-46-7	1,4-Dichlorobenzene	6800	U	
95-50-1	1,2-Dichlorobenzene	6800	U	
95-48-7	2-Methylphenol	6800	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	6800	U	
106-44-5	4-Methylphenol	6800	U	
621-64-7	N-Nitroso-Di-n-Propylamine	6800	U	
67-72-1	Hexachloroethane	6800	U	
98-95-3	Nitrobenzene	6800	U	
78-59-1	Isophorone	6800	U	
88-75-5	2-Nitrophenol	6800	U	
105-67-9	2,4-Dimethylphenol	6800	U	
111-91-1	bis(2-Chloroethoxy)Methane	6800	U	
120-83-2	2,4-Dichlorophenol	6800	U	
120-82-1	1,2,4-Trichlorobenzene	6800	U	
91-20-3	Naphthalene	6800	U	
106-47-8	4-Chloroaniline	6800	U	
87-68-3	Hexachlorobutadiene	6800	U	
59-50-7	4-Chloro-3-Methylphenol	6800	U	
91-57-6	2-Methylnaphthalene	6800	U	
77-47-4	Hexachlorocyclopentadiene	6800	U	
88-06-2	2,4,6-Trichlorophenol	6800	U	
95-95-4	2,4,5-Trichlorophenol	16000	U	
91-58-7	2-Chloronaphthalene	6800	U	
88-74-4	2-Nitroaniline	16000	U	
131-11-3	Dimethylphthalate	6800	U	
208-96-8	Acenaphthylene	6800	U	
99-09-2	3-Nitroaniline	16000	U	
83-32-9	Acenaphthene	6800	U	
51-28-5	2,4-Dinitrophenol	16000	U	

·031

Verified [signature] 4/4/94

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04B

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120S08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 8.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	16000	U
132-64-9	Dibenzofuran	6800	U
121-14-2	2,4-Dinitrotoluene	6800	U
606-20-2	2,6-Dinitrotoluene	6800	U
84-66-2	Diethylphthalate	6800	U
7005-72-3	4-Chlorophenyl-phenylether	6800	U
86-73-7	Fluorene	6800	U
100-01-6	4-Nitroaniline	16000	U
534-52-1	4,6-Dinitro-2-methylphenol	16000	U
86-30-6	N-Nitrosodiphenylamine (1)	6800	U
101-55-3	4-Bromophenyl-phenylether	6800	U
118-74-1	Hexachlorobenzene	6800	U
87-86-5	Pentachlorophenol	16000	U
85-01-8	Phenanthrene	6800	U
120-12-7	Anthracene	6800	U
86-74-8	Carbazole	6800	U
84-74-2	Di-n-Butylphthalate	6800	U
206-44-0	Fluoranthene	6800	U
129-00-0	Pyrene	6800	U
85-68-7	Butylbenzylphthalate	6800	U
91-94-1	3,3'-Dichlorobenzidine	6800	U
56-55-3	Benzo(a)Anthracene	6800	U
117-81-7	bis(2-Ethylhexyl)Phthalate	6800	U
218-01-9	Chrysene	6800	U
117-84-0	Di-n-Octyl Phthalate	6800	U
205-99-2	Benzo(b)Fluoranthene	6800	U
207-08-9	Benzo(k)Fluoranthene	6800	U
50-32-8	Benzo(a)Pyrene	6800	U
193-39-5	Indeno(1,2,3-cd)Pyrene	6800	U
53-70-3	Dibenz(a,h)Anthracene	6800	U
191-24-2	Benzo(g,h,i)Perylene	6800	U

Q

(1) - Cannot be separated from Diphenylamine

Verified 4/4/94

9713517.1287

~~000531~~

EPA SAMPLE NO.

B09DR0

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-04B

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120S08

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 5 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 8.0

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	10.17	61000	~~J~~	~~J~~
2.	UNKNOWN ALKANE	10.38	330000	~~J~~	~~J~~
3.	UNKNOWN HYDROCARBON	11.12	70000	~~J~~	~~J~~
4.	UNKNOWN ALKANE	11.28	59000	~~J~~	~~J~~
5.	UNKNOWN ALKANE	11.48	64000	~~J~~	~~J~~
6.	UNKNOWN ALKANE	11.58	44000	~~J~~	~~J~~
7.	UNKNOWN HYDROCARBON	11.78	30000	~~J~~	~~J~~
8.	UNKNOWN ALKANE	12.10	440000	~~J~~	~~J~~
9.	UNKNOWN ALKANE	12.30	270000	~~J~~	~~J~~
10.	UNKNOWN HYDROCARBON	12.60	57000	~~J~~	~~J~~
11.	UNKNOWN CYCLIC HYDROCARBON	12.83	150000	~~J~~	~~J~~
12.	UNKNOWN HYDROCARBON	13.00	69000	~~J~~	~~J~~
13.	UNKNOWN ALKANE	13.10	82000	~~J~~	~~J~~
14.	UNKNOWN ALKANE	13.25	350000	~~J~~	~~J~~
15.	UNKNOWN ALKANE	13.70	530000	~~J~~	~~J~~
16.	UNKNOWN ALKANE	13.92	98000	~~J~~	~~J~~
17.	UNKNOWN CYCLIC HYDROCARBON	14.45	150000	~~J~~	~~J~~
18.	UNKNOWN ALKANE	14.60	88000	~~J~~	~~J~~
19.	UNKNOWN ALKANE	15.17	530000	~~J~~	~~J~~
20. 126-73-8	PHOSPHORIC ACID TRIBUTYL EST	18.48	1200000	JN	

verified
4/4/94

9213517.1288

~~000567~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40119S10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 10.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	820	U

Q

034

Verified 4/4/94

9713517.1289

~~000568~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40119S10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 10.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	820	U	
132-64-9	Dibenzofuran	340	U	
121-14-2	2,4-Dinitrotoluene	340	U	
606-20-2	2,6-Dinitrotoluene	340	U	
84-66-2	Diethylphthalate	340 ~~78~~	~~BJ~~	u
7005-72-3	4-Chlorophenyl-phenylether	340	U	
86-73-7	Fluorene	340	U	
100-01-6	4-Nitroaniline	820	U	
534-52-1	4,6-Dinitro-2-methylphenol	820	U	
86-30-6	N-Nitrosodiphenylamine (1)	340	U	
101-55-3	4-Bromophenyl-phenylether	340	U	
118-74-1	Hexachlorobenzene	340	U	
87-86-5	Pentachlorophenol	820	U	
85-01-8	Phenanthrene	340	U	
120-12-7	Anthracene	340	U	
86-74-8	Carbazole	340	U	
84-74-2	Di-n-Butylphthalate	340 ~~140~~	~~BJ~~	u
206-44-0	Fluoranthene	340	U	
129-00-0	Pyrene	340	U	
85-68-7	Butylbenzylphthalate	340	U	
91-94-1	3,3'-Dichlorobenzidine	340	U	
56-55-3	Benzo(a)Anthracene	340	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	110	J	
218-01-9	Chrysene	340	U	
117-84-0	Di-n-Octyl Phthalate	340	U	
205-99-2	Benzo(b)Fluoranthene	340	U	
207-08-9	Benzo(k)Fluoranthene	340	U	
50-32-8	Benzo(a)Pyrene	340	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U	
53-70-3	Dibenz(a,h)Anthracene	340	U	
191-24-2	Benzo(g,h,i)Perylene	340	U	

(1) - Cannot be separated from Diphenylamine

Verified 4/4/94

FORM I SV-2 3/90

·035

9713517.1290

~~000569~~

EPA SAMPLE NO.

B09DR1

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-06B

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 40119S10

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 10.2

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.80	35000	~~BAJN~~	UR
2.	UNKNOWN HYDROCARBON	5.98	310	~~BJ~~	UJN
3.	UNKNOWN HYDROCARBON	6.45	340	~~BJ~~	UJN
4.	UNKNOWN HYDROCARBON	6.93	100	~~BJ~~	UJN
5.	UNKNOWN HYDROCARBON	7.08	5300	~~BJ~~	UJN
6.	UNKNOWN HYDROCARBON	7.38	750	~~J~~	JN
7.	UNKNOWN HYDROCARBON	8.40	750	~~J~~	UJN
8.	UNKNOWN ALCOHOL	8.77	1100	~~J~~	JN
9.	UNKNOWN HYDROCARBON	10.45	100	~~J~~	JN
10.	UNKNOWN HYDROCARBON	11.12	140	~~J~~	JN
11.	UNKNOWN HYDROCARBON	12.00	68	~~BJ~~	UJN
12.	UNKNOWN ALKANE	13.25	68	~~J~~	JN
13.	UNKNOWN ALKANE	13.68	200	~~J~~	JN
14.	UNKNOWN ALKANE	15.17	200	~~J~~	JN
15.	UNKNOWN HYDROCARBON	16.58	68	~~J~~	JN
16. 126-78-3	PHOSPHORIC ACID TRIBUTYL EST	18.40	580	JN	
17.	UNKNOWN CARBOXYLIC ACID ESTE	21.02	440	~~BJ~~	UJN
18.	HEXANEDIOIC ACID ESTER	25.95	240	~~J~~	JN

Verified
4/4/94

036

9213517.1291

~~000606~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40119S09

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	330	U	
111-44-4	bis(2-Chloroethyl)Ether	330	U	
95-57-8	2-Chlorophenol	330	U	
541-73-1	1,3-Dichlorobenzene	330	U	
106-46-7	1,4-Dichlorobenzene	330	U	
95-50-1	1,2-Dichlorobenzene	330	U	
95-48-7	2-Methylphenol	330	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U	
106-44-5	4-Methylphenol	330	U	
621-64-7	N-Nitroso-Di-n-Propylamine	330	U	
67-72-1	Hexachloroethane	330	U	
98-95-3	Nitrobenzene	330	U	
78-59-1	Isophorone	330	U	
88-75-5	2-Nitrophenol	330	U	
105-67-9	2,4-Dimethylphenol	330	U	
111-91-1	bis(2-Chloroethoxy)Methane	330	U	
120-83-2	2,4-Dichlorophenol	330	U	
120-82-1	1,2,4-Trichlorobenzene	330	U	
91-20-3	Naphthalene	330	U	
106-47-8	4-Chloroaniline	330	U	
87-68-3	Hexachlorobutadiene	330	U	
59-50-7	4-Chloro-3-Methylphenol	330	U	
91-57-6	2-Methylnaphthalene	330	U	
77-47-4	Hexachlorocyclopentadiene	330	U	
88-06-2	2,4,6-Trichlorophenol	330	U	
95-95-4	2,4,5-Trichlorophenol	800	U	
91-58-7	2-Chloronaphthalene	330	U	
88-74-4	2-Nitroaniline	800	U	
131-11-3	Dimethylphthalate	330	U	
208-96-8	Acenaphthylene	330	U	
99-09-2	3-Nitroaniline	800	U	
83-32-9	Acenaphthene	330	U	
51-28-5	2,4-Dinitrophenol	800	U	

-037

Verified [signature] 4/4/94

9713517.1292

~~000607~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40119S09

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	800	U	
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330 ~~58~~	~~BJ~~	u
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	800	U	
534-52-1	4,6-Dinitro-2-methylphenol	800	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	800	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~260~~	~~BJ~~	u
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U	
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified

FORM I SV-2 4/4/94 3/90

038

9213517.1293

~~000608~~
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DR3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-05B

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 40119S09

Level: (low/med) LOW Date Received: 12/20/93

% Moisture: 2 decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.8

Number TICs found: 21

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.77	17000	~~BJNA~~	JR
2.	UNKNOWN HYDROCARBON	7.07	4500	~~BJ~~	JN
3.	UNKNOWN HYDROCARBON	7.37	700	~~J~~	JN
4.	UNKNOWN HYDROCARBON	8.38	630	~~BJ~~	JN
5.	UNKNOWN ALCOHOL	8.77	1100	~~J~~	JN
6.	UNKNOWN ALKANE	12.12	3400	~~J~~	JN
7.	UNKNOWN ALKANE	12.32	1900	~~J~~	JN
8.	UNKNOWN CYCLIC HYDROCARBON	12.88	730	~~J~~	JN
9.	UNKNOWN ALKANE	12.93	400	~~J~~	JN
10.	UNKNOWN ALKANE	13.13	570	~~J~~	JN
11.	UNKNOWN ALKANE	13.25	3500	~~J~~	JN
12.	UNKNOWN ALKANE	13.72	5900	~~J~~	JN
13.	UNKNOWN ALKANE	13.95	800	~~J~~	JN
14.	UNKNOWN HYDROCARBON	14.48	1200	~~J~~	JN
15.	UNKNOWN ALKANE	14.65	800	~~J~~	JN
16.	UNKNOWN ALKANE	14.82	4400	~~J~~	JN
17.	UNKNOWN ALKANE	15.18	6800	~~J~~	JN
18.	UNKNOWN ALKANE	16.02	3200	~~J~~	JN
19.	UNKNOWN ALKANE	16.58	3000	~~J~~	JN
20. 126-78-3	PHOSPHORIC ACID TRIBUTYL EST	18.52	63000	JN	
21.	HEXANEDIOIC ACID ESTER	25.95	800	~~J~~	JN

Verified
4/4/94

039

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01D

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120I03

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	330	U	
111-44-4	bis(2-Chloroethyl)Ether	330	U	
95-57-8	2-Chlorophenol	330	U	
541-73-1	1,3-Dichlorobenzene	330	U	
106-46-7	1,4-Dichlorobenzene	330	U	
95-50-1	1,2-Dichlorobenzene	330	U	
95-48-7	2-Methylphenol	330	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U	
106-44-5	4-Methylphenol	330	U	
621-64-7	N-Nitroso-Di-n-Propylamine	330	U	
67-72-1	Hexachloroethane	330	U	
98-95-3	Nitrobenzene	330	U	
78-59-1	Isophorone	330	U	
88-75-5	2-Nitrophenol	330	~~U~~	VS
105-67-9	2,4-Dimethylphenol	330	U	
111-91-1	bis(2-Chloroethoxy)Methane	330	U	
120-83-2	2,4-Dichlorophenol	330	U	
120-82-1	1,2,4-Trichlorobenzene	330	U	
91-20-3	Naphthalene	330	U	
106-47-8	4-Chloroaniline	330	U	
87-68-3	Hexachlorobutadiene	330	U	
59-50-7	4-Chloro-3-Methylphenol	330	U	
91-57-6	2-Methylnaphthalene	330	U	
77-47-4	Hexachlorocyclopentadiene	330	U	
88-06-2	2,4,6-Trichlorophenol	330	U	
95-95-4	2,4,5-Trichlorophenol	800	U	
91-58-7	2-Chloronaphthalene	330	U	
88-74-4	2-Nitroaniline	800	U	
131-11-3	Dimethylphthalate	330	U	
208-96-8	Acenaphthylene	330	U	
99-09-2	3-Nitroaniline	800	U	
83-32-9	Acenaphthene	330	U	
51-28-5	2,4-Dinitrophenol	800	~~U~~	VS

9713517.1295

~~000307~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR4

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01D

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120I03

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	800	~~U~~	UJ
132-64-9	Dibenzofuran	330	U	
121-14-2	2,4-Dinitrotoluene	330	U	
606-20-2	2,6-Dinitrotoluene	330	U	
84-66-2	Diethylphthalate	330 ~~60~~	~~BJ~~	U
7005-72-3	4-Chlorophenyl-phenylether	330	U	
86-73-7	Fluorene	330	U	
100-01-6	4-Nitroaniline	800	U	
534-52-1	4,6-Dinitro-2-methylphenol	800	U	
86-30-6	N-Nitrosodiphenylamine (1)	330	U	
101-55-3	4-Bromophenyl-phenylether	330	U	
118-74-1	Hexachlorobenzene	330	U	
87-86-5	Pentachlorophenol	800	U	
85-01-8	Phenanthrene	330	U	
120-12-7	Anthracene	330	U	
86-74-8	Carbazole	330	U	
84-74-2	Di-n-Butylphthalate	330 ~~90~~	~~BJ~~	U
206-44-0	Fluoranthene	330	U	
129-00-0	Pyrene	330	U	
85-68-7	Butylbenzylphthalate	330	U	
91-94-1	3,3'-Dichlorobenzidine	330	U	
56-55-3	Benzo(a)Anthracene	330	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	160	J	
218-01-9	Chrysene	330	U	
117-84-0	Di-n-Octyl Phthalate	330	U	
205-99-2	Benzo(b)Fluoranthene	330	U	
207-08-9	Benzo(k)Fluoranthene	330	U	
50-32-8	Benzo(a)Pyrene	330	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U	
53-70-3	Dibenz(a,h)Anthracene	330	U	
191-24-2	Benzo(g,h,i)Perylene	330	U	

(1) - Cannot be separated from Diphenylamine

Verified 3/31/94

041

FORM I SV-2 3/90

9713517.1296

~~000308~~

EPA SAMPLE NO.

B09DR4

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-01D

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 40120I03

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.8

Number TICs found: 16

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.18	200	~~BJ~~	UJN
2.	UNKNOWN HYDROCARBON	5.52	170	~~BJ~~	UJN
3.	UNKNOWN HYDROCARBON	5.67	340	~~BJ~~	UJN
4.	UNKNOWN HYDROCARBON	5.77	67	~~BJ~~	UJN
5.	UNKNOWN HYDROCARBON	6.13	130	~~BJ~~	UJN
6.	UNKNOWN GLYCOL ETHER	6.25	5800	~~BJ~~	UJN
7.	UNKNOWN HYDROCARBON	6.58	500	~~BJ~~	UJN
8.	UNKNOWN HYDROCARBON	6.77	100	~~BJ~~	UJN
9.	UNKNOWN HYDROCARBON	7.52	700	~~BJ~~	UJN
10.	UNKNOWN ALKENE	7.83	67	~~J~~	UJN
11.	UNKNOWN ALCOHOL	7.90	640	~~J~~	UJN
12.	UNKNOWN HYDROCARBON	10.18	67	~~J~~	UJN
13.	UNKNOWN ALKANE	24.22	100	~~J~~	JN
14.	HEXANEDIOIC ACID ISOMER	25.02	15000	~~J~~	JN
15.	UNKNOWN ALKANE	25.12	130	~~J~~	JN
16.	UNKNOWN ALKANE	26.80	67	~~J~~	JN

Verified
[illegible] 3/31/94

042

97,3517.1297

~~000344~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40120I04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	340	U	
111-44-4	bis(2-Chloroethyl)Ether	340	U	
95-57-8	2-Chlorophenol	340	U	
541-73-1	1,3-Dichlorobenzene	340	U	
106-46-7	1,4-Dichlorobenzene	340	U	
95-50-1	1,2-Dichlorobenzene	340	U	
95-48-7	2-Methylphenol	340	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U	
106-44-5	4-Methylphenol	340	U	
621-64-7	N-Nitroso-Di-n-Propylamine	340	U	
67-72-1	Hexachloroethane	340	U	
98-95-3	Nitrobenzene	340	U	
78-59-1	Isophorone	340	U	
88-75-5	2-Nitrophenol	340	~~U~~	UJ
105-67-9	2,4-Dimethylphenol	340	U	
111-91-1	bis(2-Chloroethoxy)Methane	340	U	
120-83-2	2,4-Dichlorophenol	340	U	
120-82-1	1,2,4-Trichlorobenzene	340	U	
91-20-3	Naphthalene	340	U	
106-47-8	4-Chloroaniline	340	U	
87-68-3	Hexachlorobutadiene	340	U	
59-50-7	4-Chloro-3-Methylphenol	340	U	
91-57-6	2-Methylnaphthalene	340	U	
77-47-4	Hexachlorocyclopentadiene	340	U	
88-06-2	2,4,6-Trichlorophenol	340	U	
95-95-4	2,4,5-Trichlorophenol	820	U	
91-58-7	2-Chloronaphthalene	340	U	
88-74-4	2-Nitroaniline	820	U	
131-11-3	Dimethylphthalate	340	U	
208-96-8	Acenaphthylene	340	U	
99-09-2	3-Nitroaniline	820	U	
83-32-9	Acenaphthene	340	U	
51-28-5	2,4-Dinitrophenol	820	~~U~~	UJ

FORM I SV-1 Verified 3/31/94

~~043~~ 043 4/18/94

9213517.1298

~~000345~~

EPA SAMPLE NO.

B09DR5

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40120I04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	820	~~U~~	U
132-64-9	Dibenzofuran	340	U	
121-14-2	2,4-Dinitrotoluene	340	U	
606-20-2	2,6-Dinitrotoluene	340	U	
84-66-2	Diethylphthalate	340 ~~79~~	~~BJ~~	U
7005-72-3	4-Chlorophenyl-phenylether	340	U	
86-73-7	Fluorene	340	U	
100-01-6	4-Nitroaniline	820	U	
534-52-1	4,6-Dinitro-2-methylphenol	820	U	
86-30-6	N-Nitrosodiphenylamine (1)	340	U	
101-55-3	4-Bromophenyl-phenylether	340	U	
118-74-1	Hexachlorobenzene	340	U	
87-86-5	Pentachlorophenol	820	U	
85-01-8	Phenanthrene	340	U	
120-12-7	Anthracene	340	U	
86-74-8	Carbazole	340	U	
84-74-2	Di-n-Butylphthalate	340 ~~110~~	~~BJ~~	U
206-44-0	Fluoranthene	340	U	
129-00-0	Pyrene	340	U	
85-68-7	Butylbenzylphthalate	340	U	
91-94-1	3,3'-Dichlorobenzidine	340	U	
56-55-3	Benzo(a)Anthracene	340	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	120	J	
218-01-9	Chrysene	340	U	
117-84-0	Di-n-Octyl Phthalate	340	U	
205-99-2	Benzo(b)Fluoranthene	340	U	
207-08-9	Benzo(k)Fluoranthene	340	U	
50-32-8	Benzo(a)Pyrene	340	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U	
53-70-3	Dibenz(a,h)Anthracene	340	U	
191-24-2	Benzo(g,h,i)Perylene	340	U	

(1) - Cannot be separated from Diphenylamine

Verified 3/31/94

·044

97/3517.1299

~~000346~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-02B

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 40120I04

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

Number TICs found: 20

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN GLYCOL ETHER	6.25	6500	~~BJ~~	NJ
2.	UNKNOWN ALKANE	9.57	20000	~~J~~	NJ
3.	UNKNOWN ALKANE	10.45	4400	~~J~~	NJ
4.	UNKNOWN ALKANE	10.62	4900	~~J~~	NJ
5.	UNKNOWN ALKANE	11.23	30000	~~J~~	NJ
6.	UNKNOWN ALKANE	11.42	16000	~~J~~	NJ
7.	UNKNOWN HYDROCARBON	11.90	5700	~~J~~	NJ
8.	UNKNOWN HYDROCARBON	12.03	6900	~~J~~	NJ
9.	UNKNOWN ALKANE	12.32	23000	~~J~~	NJ
10.	UNKNOWN ALKANE	12.78	38000	~~J~~	NJ
11.	UNKNOWN ALKANE	12.88	5900	~~J~~	NJ
12.	UNKNOWN ALKANE	12.98	5200	~~J~~	NJ
13.	UNKNOWN ALCOHOL	13.47	11000	~~J~~	NJ
14.	UNKNOWN ALKANE	13.67	6600	~~J~~	NJ
15.	UNKNOWN ALKANE	13.85	25000	~~J~~	NJ
16.	UNKNOWN ALKANE	14.20	41000	~~J~~	NJ
17.	UNKNOWN ALKANE	14.98	19000	~~J~~	NJ
18.	UNKNOWN ALKANE	15.53	21000	~~J~~	NJ
19.	PHOSPHORIC ACID ESTER	17.42	98000	~~J~~	NJ
20.	HEXANEDIOIC ACID ISOMER	25.02	15000	~~J~~	NJ

045

Verified 3/31/94

~~000389~~

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40120I07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
108-95-2	Phenol	350	U	
111-44-4	bis(2-Chloroethyl)Ether	350	U	
95-57-8	2-Chlorophenol	350	U	
541-73-1	1,3-Dichlorobenzene	350	U	
106-46-7	1,4-Dichlorobenzene	350	U	
95-50-1	1,2-Dichlorobenzene	350	U	
95-48-7	2-Methylphenol	350	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U	
106-44-5	4-Methylphenol	350	U	
621-64-7	N-Nitroso-Di-n-Propylamine	350	U	
67-72-1	Hexachloroethane	350	U	
98-95-3	Nitrobenzene	350	U	
78-59-1	Isophorone	350	U	
88-75-5	2-Nitrophenol	350	~~U~~	WS
105-67-9	2,4-Dimethylphenol	350	U	
111-91-1	bis(2-Chloroethoxy)Methane	350	U	
120-83-2	2,4-Dichlorophenol	350	U	
120-82-1	1,2,4-Trichlorobenzene	350	U	
91-20-3	Naphthalene	350	U	
106-47-8	4-Chloroaniline	350	U	
87-68-3	Hexachlorobutadiene	350	U	
59-50-7	4-Chloro-3-Methylphenol	350	U	
91-57-6	2-Methylnaphthalene	350	U	
77-47-4	Hexachlorocyclopentadiene	350	U	
88-06-2	2,4,6-Trichlorophenol	350	U	
95-95-4	2,4,5-Trichlorophenol	850	U	
91-58-7	2-Chloronaphthalene	350	U	
88-74-4	2-Nitroaniline	850	U	
131-11-3	Dimethylphthalate	350	U	
208-96-8	Acenaphthylene	350	U	
99-09-2	3-Nitroaniline	850	U	
83-32-9	Acenaphthene	350	U	
51-28-5	2,4-Dinitrophenol	850	~~U~~	WS

Verified 3/31/94

9713517.1301

~~000390~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40120I07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	Q
100-02-7	4-Nitrophenol	850	~~U~~	U
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350 ~~200~~	~~BJ~~	U
7005-72-3	4-Chlorophenyl-phenylether	350	U	
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	850	U	
534-52-1	4,6-Dinitro-2-methylphenol	850	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	850	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	350 ~~140~~	~~BJ~~	U
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350	U	
85-68-7	Butylbenzylphthalate	350	U	
91-94-1	3,3'-Dichlorobenzidine	350	U	
56-55-3	Benzo(a)Anthracene	350	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	100	J	
218-01-9	Chrysene	350	U	
117-84-0	Di-n-Octyl Phthalate	350	U	
205-99-2	Benzo(b)Fluoranthene	350	U	
207-08-9	Benzo(k)Fluoranthene	350	U	
50-32-8	Benzo(a)Pyrene	350	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U	
53-70-3	Dibenz(a,h)Anthracene	350	U	
191-24-2	Benzo(g,h,i)Perylene	350	U	

(1) - Cannot be separated from Diphenylamine

047

Verified

FORM I SV-2 3/31/94 3/90

9713517.1302

~~000391~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B09DR6

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-03B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 40120I07

Level: (low/med) LOW Date Received: 12/22/93

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.9

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.18	210	~~BJ~~	NJ
2.	UNKNOWN HYDROCARBON	5.50	180	~~BJ~~	NJ
3.	UNKNOWN HYDROCARBON	5.67	350	~~BJ~~	NJ
4.	UNKNOWN HYDROCARBON	5.75	71	~~BJ~~	NJ
5.	UNKNOWN GLYCOL ETHER	6.25	5700	~~BJ~~	NJ
6.	UNKNOWN HYDROCARBON	6.57	420	~~BJ~~	NJ
7.	UNKNOWN HYDROCARBON	6.75	110	~~BJ~~	NJ
8.	UNKNOWN HYDROCARBON	7.52	740	~~BJ~~	NJ
9.	UNKNOWN HYDROCARBON	7.58	320	~~BJ~~	NJ
10.	UNKNOWN ALCOHOL	7.90	960	~~BJ~~	NJ
11.	UNKNOWN HYDROCARBON	10.08	71	~~J~~	NJ
12.	UNKNOWN HYDROCARBON	10.18	71	~~BJ~~	NJ
13.	UNKNOWN HYDROCARBON	13.20	250	~~J~~	NJ
14.	UNKNOWN HYDROCARBON	16.18	140	~~J~~	NJ
15.	PHOSPHORIC ACID ESTER	17.35	58000	~~J~~	NJ
16.	UNKNOWN ALKANE	24.22	71	~~J~~	NJ
17.	HEXANEDIOIC ACID ISOMER	25.02	18000	~~J~~	NJ
18.	UNKNOWN HYDROCARBON	25.12	71	~~J~~	NJ

L048

Verified 3/31/94

FORM I SV-TIC 3/90

97-3517.1303

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-010

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 8, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP9	A3-12-010-01A	V	SOIL
B09DP9 MS	A3-12-010-01B	V	SOIL
B09DP9 MSD	A3-12-010-01C	V	SOIL
B09DQ0	A3-12-010-02A	V	SOIL
B09DQ0	A3-12-010-02B	SV	SOIL
B09DQ0 MS	A3-12-010-02C	SV	SOIL
B09DQ0 MSD	A3-12-010-02D	SV	SOIL
B09DQ0	A3-12-010-02G	K	SOIL
B09DQ1	A3-12-010-03A	V	SOIL
B09DQ1	A3-12-010-03B	SV	SOIL
B09DQ1	A3-12-010-03E	K	SOIL
B09DQ1 MS	A3-12-010-03F	K	SOIL
B09DQ1 MSD	A3-12-010-03G	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Low concentrations of Di-n-Butylphthalate were detected in the blank and all the samples that were tested for semivolatiles.

The surrogate recovery for Terphenyl-d14 on sample B09DQ0MSD, was above the contract required QC limits. In accordance with CLP protocol no further action was taken.

The spike recoveries for sample B09DQ0MSD, were above the QC limits for Phenol, 4-Nitrophenol, and 2,4-Dinitrotoluene. The results for 4-Nitrophenol have been "E" qualified since the actual concentration detected in the MSD exceeded the calibration of the instrument. The %RPD for 1,2,4-Trichlorobenzene and Acenaphthene were slightly above the QC limits. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

No Kerosene was detected in any of the samples. Sample B09DQ1 was spiked with Kerosene. The matrix spike recoveries were 69% and 70%. The blank spike was prepared at the same time and had an 72% recovery.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish

Maureen Parrish 1/21/94
Project Manager

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 15, 1993

1.0 DESCRIPTION OF CASE :

One soil sample was analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ6	A3-12-029-01A	V	SOIL
B09DQ6 MS	A3-12-029-01B	V	SOIL
B09DQ6 MSD	A3-12-029-01C	V	SOIL
B09DQ6	A3-12-029-01D	SV	SOIL
B09DQ6 MS	A3-12-029-01E	SV	SOIL
B09DQ6 MSD	A3-12-029-01F	SV	SOIL
B09DQ6	A3-12-029-01J	K	SOIL
B09DQ6 MS	A3-12-029-01K	K	SOIL
B09DQ6 MSD	A3-12-029-01L	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the sample was analyzed as a medium-level soil. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner.

All of the QC results were within the limits specified by the EPA CLP SOW.

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TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the sample was concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the sample was performed by the analyst prior to injection. The large dilution was necessary based on the viscous nature of the extract. The matrix spikes and surrogates were not recoverable due to the large sample dilution. The blank, SBLK1217S2, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL. A 1:50 dilution was performed on the sample by the analyst prior to injection.

The matrix spiking solution was added at a concentration of approximately 240 ppm. Due to the large concentration of Kerosene in the sample, an accurate recovery of the matrix spiking compounds could not be obtained. The blank spike had

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a 66% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the results were reported on a wet weight basis.

All of the other QC results were within the limits specified by the SW-846 Method 8015M.

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Maureen Parrish 2/17/94
Maureen Parrish
Project Manager

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-044

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 20, 1993

1.0 DESCRIPTION OF CASE :

Seven soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ7	A3-12-044-01A	V	SOIL
B09DQ7 MS	A3-12-044-01B	V	SOIL
B09DQ7 MSD	A3-12-044-01C	V	SOIL
B09DQ7	A3-12-044-01D	SV	SOIL
B09DQ7	A3-12-044-01F	K	SOIL
B09DQ8	A3-12-044-02A	V	SOIL
B09DQ8	A3-12-044-02B	SV	SOIL
B09DQ8 MS	A3-12-044-02C	SV	SOIL
B09DQ8 MSD	A3-12-044-02D	SV	SOIL
B09DQ8	A3-12-044-02F	K	SOIL
B09DQ9	A3-12-044-03A	V	SOIL
B09DQ9	A3-12-044-03B	SV	SOIL
B09DQ9	A3-12-044-03E	K	SOIL
B09DR0	A3-12-044-04A	V	SOIL
B09DR0 MS	A3-12-044-04G	V	SOIL
B09DR0 MSD	A3-12-044-04H	V	SOIL
B09DR0	A3-12-044-04B	SV	SOIL
B09DR0	A3-12-044-04F	K	SOIL
B09DR3	A3-12-044-05A	V	SOIL
B09DR3	A3-12-044-05B	SV	SOIL
B09DR3	A3-12-044-05E	K	SOIL
B09DR3 MS	A3-12-044-05F	K	SOIL
B09DR3 MSD	A3-12-044-05G	K	SOIL
B09DR1	A3-12-044-06A	V	SOIL
B09DR1	A3-12-044-06B	SV	SOIL
B09DR1	A3-12-044-06D	K	SOIL
B09DR2	A3-12-044-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

Hexane was detected as a TIC (tentatively identified compound) in samples B09DR1, B09DR2, and the blank, VBLK1223R.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DQ8, B09DQ9, and B09DR0. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR0MS and B09DR0MSD were within the QC limits.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the samples B09DQ8, B09DQ8MS, and B09DQ8MSD, were concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the same samples were performed by the analyst prior to injection. For sample B09DR0, a 1:20 dilution was performed by the analyst prior to

injection. The large dilutions were necessary based on the viscous nature of the extracts.

The matrix spikes and surrogates were not recoverable for samples B09DQ8, B09DQ8MS, and B09DQ8MSD, due to the large dilutions. The blank, SBLK1223S2, and samples B09DQ7, B09DQ9, B09DR1, and B09DR3, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits. For sample B09DR0, all of the surrogates were diluted out, with the exception of 2-Fluorobiphenyl, Terphenyl-d14, and 1,2-Dichlorobenzene-d4; 2-Chlorophenol-d4 was not diluted out, although the recoveries were still below the QC limits.

In samples B09DQ7, B09DQ9, B09DR1, B09DR3, and SBLK1223S2, the compound 4-Hydroxy-4-methyl-2-pentanone was detected as a Aldol condensation TIC, and therefore "A" qualified. There were several other TICs detected in each sample. In addition, both Diethylphthalate and Di-n-butylphthalate were detected below the CRQL in samples B09DQ7, B09DQ9, B09DR1, B09DR3, and in the blank. In all of the samples, with the exception of sample B09DQ7, the compound Phosphoric Acid Tributyl Ester was detected as a TIC and "N" qualified.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 950ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

A 1:50 dilution of samples B09DQ8, B09DQ9, and B09DR0, was performed in order to bring the results within the linear range of the instrument. Sample B09DR3 was spiked with Kerosene. The matrix spike recoveries ranged from 67% to 68%.

The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth

Nicole Roth 2/23/94
Program Manager

Maureen Parrish

Maureen Parrish 2/22/94
Project Manager

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-051

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 22, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DR4	A3-12-051-01A	V	SOIL
B09DR4 MS	A3-12-051-01B	V	SOIL
B09DR4 MSD	A3-12-051-01C	V	SOIL
B09DR4	A3-12-051-01D	SV	SOIL
B09DR4	A3-12-051-01G	K	SOIL
B09DR5	A3-12-051-02A	V	SOIL
B09DR5 MS	A3-12-051-02H	V	SOIL
B09DR5 MSD	A3-12-051-02I	V	SOIL
B09DR5	A3-12-051-02B	SV	SOIL
B09DR5 MS	A3-12-051-02C	SV	SOIL
B09DR5 MSD	A3-12-051-02D	SV	SOIL
B09DR5	A3-12-051-02G	K	SOIL
B09DR6	A3-12-051-03A	V	SOIL
B09DR6	A3-12-051-03B	SV	SOIL
B09DR6	A3-12-051-03D	K	SOIL
B09DR6 MS	A3-12-051-03E	K	SOIL
B09DR6 MSD	A3-12-051-03F	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed, with the required QC, by heated purge within the CLP SOW holding times.

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The analyte Toluene was detected below the CRQL in samples B09DR4, B09DR6, and the blank, VBLK1229R. In addition, Hexane was detected as a TIC (tentatively identified compound) in samples B09DR4 and B09DR6.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed, with the required QC, within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DR5, B09DR5MS, and B09DR5MSD. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR5MS and B09DR5MSD were within the QC limits. The surrogate 1,2-Dichloroethane-d4 had a recovery above the QC limits in sample B09DR5MSD.

All of the other QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In samples B09DR4, B09DR5, B09DR6, and B09DR5MSD, Diethylphthalate, Di-n-butylphthalate, and bis(2-Ethylhexyl)phthalate were detected at concentrations less than the CRQL. Only Diethylphthalate and Di-n-butylphthalate were detected in sample B09DR5MS and in the blank, SBLK1229S2, below the CRQL.

The matrix spikes recoveries for 4-Nitrophenol were below the QC limits in samples B09DR5MS and B09DR5MSD. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

Kerosene was detected in samples B09DR5 and B09DR6. Sample B09DR6 was spiked with Kerosene, and the matrix spike recoveries were 71% for the MS, and 57% for the MSD. The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth
Nicole Roth 2/23/94
Program Manager

Maureen Parrish
Maureen Parrish 2/22/94
Project Manager

9713517.1317

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Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-03-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322911

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~
~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Loren E. Rogers 12-07-93	J.D. Franklin	12/7/93 1309
Relinquished by: 12/7/93 J.D. Franklin 1335	Received by: H. NARCISO	Date/Time: 12-08-93 1:00 P.M
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9513517.1318

000002C

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-06-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322911

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

SER 12-06-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

SER 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Leon Rogers 12-7-93	J.D. Fankhr J.D. Fankhr	12/7/93 1305
Relinquished by: J.D. Fankhr J.D. Fankhr 12/7/93 1335	Received by: Sonia Sze/H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1319

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-09-93

Ice Chest No.: SML-437

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

12-09-93

3)

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Karen E. Rogers 0950	[signature]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9313517.1320

000002E

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

L066

9413517.1321

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ8

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0945 Loren E Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1322

000002

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-14-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ9

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR0

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3) ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

12-14-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Lorene E. Page 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

068

9713512.1323

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-15-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml GW:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3) ~~B09~~

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 Loren E. Rogers 1200	W.V. Selzer	12-17-93 1200
Relinquished by: W.V. Selzer	Received by: Ramirez	Date/Time: 12-20-93 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Rec'd SATURDAY BUT opened 12-20-93 12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

069

9213517.1324

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No.: — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DR3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

070

9213517.1325

000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12/16/93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8217

Offsite Property No.: IW94-0-0138#39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1)

B07DR4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845		12-21-93 0846
Relinquished by:	Received by:	Date/Time:
		12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

071

A-600D-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1526

~~C000020~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML-410 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1)

BOTTLES

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/14/93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Loren E. Rogers 12-21-93	Teresa	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

072

9713517.1327

~~000002E~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-20-93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217

Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

HER 12-20-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 Laurence Rogers 0845	W.V. Setzer	12-21-93 0846
W.V. Setzer	[illegible]	12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

073

9713517.1328

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B=9DQ6-TMA-681	
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/04/94
CASE:	SDG: B=9DQ6-TMA-681	

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☒ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils
B=9DQ0
B=9DQ1

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: D-n-butyl phthalate and several TICs were detected in the associated lab blank.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments: MSD %R for phenol, 4-nitrophenol, and 2,4-dinitrotoluene are greater ~~that~~ than the upper control limit. No qualification is required since all assoc. results are nondetects and assoc. surrogate recoveries are w/in limits.

4/4/94 ~~MS/MSD RPD for 1,2,4-trichlorobenzene and acenaphthene are greater than 20% & unacceptable. No qualification is required since all assoc results are nondetects.~~

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes (No) N/A

Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)

Are field split RPD values acceptable? . . . . . Yes No (N/A)

Comments: MS/MSD RPD for 1,2,4-trichlorobenzene and acenaphthene are unacceptable. No qualification is required since assoc. results are nondetects.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . (Yes) No N/A

Are internal standard areas acceptable? . . . . . (Yes) No N/A

Are internal standard retention times acceptable? . . . . . (Yes) No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . (Yes) No N/A

Is compound quantitation acceptable? . . . . . (Yes) No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are all results supported in the raw data? . . . . . (Yes) No N/A

Do results meet the CRQLs? . . . . . (Yes) No N/A

Has the laboratory properly identified and coded all TIC? . . . (Yes) No N/A

Comments:

077

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Sample locations are currently not available but will be evaluated in the final summary report.

4/4/94

~~Surrogate recovery for~~

The recovery for surrogate terphenyl-d14 in sample B09DC0MSD is above the upper control limit. No qualification is reqd since only one surrogate recovery is out and MSD is a QC sample only.

4/5/94

HOLDING TIME SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR: [illegible]	DATE: 4/4/94	PAGE 1 OF 1
COMMENTS: Semivolatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09Q00	BNA	12/3/93	12/10/93	12/20/93	7	10	None
B09Q01	☆	12/6/93	12/10/93	12/20/93	4	10	☆

9213517.1334

~~000349~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1210S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-BLK

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 31220S04

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	780	U
132-64-9	Dibenzofuran	320	U
121-14-2	2,4-Dinitrotoluene	320	U
606-20-2	2,6-Dinitrotoluene	320	U
84-66-2	Diethylphthalate	320	U
7005-72-3	4-Chlorophenyl-phenylether	320	U
86-73-7	Fluorene	320	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	320	U
101-55-3	4-Bromophenyl-phenylether	320	U
118-74-1	Hexachlorobenzene	320	U
87-86-5	Pentachlorophenol	780	U
85-01-8	Phenanthrene	320	U
120-12-7	Anthracene	320	U
86-74-8	Carbazole	320	U
84-74-2	Di-n-Butylphthalate	64	J
206-44-0	Fluoranthene	320	U
129-00-0	Pyrene	320	U
85-68-7	Butylbenzylphthalate	320	U
91-94-1	3,3'-Dichlorobenzidine	320	U
56-55-3	Benzo(a)Anthracene	320	U
117-81-7	bis(2-Ethylhexyl)Phthalate	320	U
218-01-9	Chrysene	320	U
117-84-0	Di-n-Octyl Phthalate	320	U
205-99-2	Benzo(b)Fluoranthene	320	U
207-08-9	Benzo(k)Fluoranthene	320	U
50-32-8	Benzo(a)Pyrene	320	U
193-39-5	Indeno(1,2,3-cd)Pyrene	320	U
53-70-3	Dibenz(a,h)Anthracene	320	U
191-24-2	Benzo(g,h,i)Perylene	320	U

NO-640

(1) - Cannot be separated from Diphenylamine

4/4/94

080

9713517.1335

~~000350~~

EPA SAMPLE NO.

SBLK1210S2

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12010 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312010-BLK

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 31220S04

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/10/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/20/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: ____

Number TICs found: 11

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	6.55	5600	J
2.	UNKNOWN HYDROCARBON	6.88	450	J
3.	UNKNOWN HYDROCARBON	7.08	65	J
4.	UNKNOWN HYDROCARBON	7.85	710	J
5.	UNKNOWN ALCOHOL	8.22	620	J
6.	UNKNOWN KETONE	9.23	65	J
7.	UNKNOWN HYDROCARBON	9.50	130	J
8.	UNKNOWN HYDROCARBON	9.87	65	J
9.	UNKNOWN HYDROCARBON	22.78	160	J
10.	UNKNOWN HYDROCARBON	23.17	65	J
11.	HEXANEDIOIC ACID ESTER ISOME	25.30	8400	J

2/4/94

081

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: 8090Q6-TMA-681	
VALIDATOR: [illegible]	LAB: TMA	DATE: 4/25/94
CASE:	SDG: 8090Q6-TMA-681	

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☒ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soil

8090Q6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

082

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments: CCV 250 for surrogate 4-Fluorophenol is 25.3%. No qualification was required since this is a surrogate, not a TCL constituent.

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Several TICs were detected in the lab blank, however, the retention times did not coincide w/the RT of the TICs in the sample. Therefore, no qualification was required.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A 4/7/94

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A 4/7/94

Comments: The surrogate recoveries and MS/MSD recoveries are all zero because they were diluted out of the sample and therefore could not be evaluated. Since the internal standards were acceptable, no qualification is required. 4/7/94

L083

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments: The sample was analyzed at a 40x dilution due to high concentration of TICs and the viscous nature of the extract.

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DQ6-TMA-681	
VALIDATOR: [illegible]	LAB: TMA		DATE: 03/31/94
CASE:		SDG: B09DQ6-TMA-681	

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☒ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09DQ7 B09DR3

B09DQ8

B09DQ9

B09DR0

B09DR1

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: - Sample locations are not currently available but will be evaluated in the final summary report.
- Diethylphthalate and di-n-butylphthalate were detected in the laboratory blank. Sample results have been qualified according to the DV procedures.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments: See last page of checklist for comments.

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments: The laboratory used half of the required amount of internal standard - (20 ul instead of 40 ul). No qualification is required since the result is not affected. ~~A factor of 2 is multipl~~ The calc. concentration is multiplied ~~by~~ a factor of 2.

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Comments to item 5:

- All surrogates were diluted out for samples B09D08, B09D08MS, and B09D08MSD. The surrogates nitrobenzene, phenol, 2-fluorophenol, and 2,4,6-tribromophenol were diluted out of sample B09DR0. The recovery for the surrogate 2-chlorophenol-d4 in sample ~~B09DR4~~ B09DR0 is 6% which is < lower control limit - however, no qualification is required ~~due~~ since the sample was analyzed at a dilution. No qualification was required for any of the sample results ~~since the samples were analyz~~ due to low surrogate recoveries since the samples were analyzed at dilutions. 4/7/94

- The MS/MSD constituents were diluted out and therefore could not be recovered. No qualification is required.

- All internal standard areas and retention times for the assoc. samples are acceptable supporting that the surrogates and MS/MSD %R were lost due to dilution only. No qualification is req'd for obvious matrix effects.

4/7/94

HOLDING TIME SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR: [illegible]	DATE: 4/4/94	PAGE 1 OF 1
COMMENTS: Semivolatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09Q27	BNA	12/13/93	12/23/93	01/19/93	10	27	None
Q8		12/13/93			10	27	
Q9		12/14/93			9	27	
R0		12/14/93		01/20/93	9	28	
R1		12/15/93		01/19/93	8	27	
R3		12/14/93			9	27	

9713517.1344

~~000716~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1223S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-BLK

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	790	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	71	J x10=710
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	790	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	84	J x10=840
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

3/31/94

FORM I SV-2

9213517.1345

~~000717~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK1223S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12044 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312044-BLK

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 40119S02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/23/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/19/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	4-HYDROXY-4-METHYL-2-PENTANO	5.75	14000	~~JNA~~ R
2.	UNKNOWN HYDROCARBON	5.97	230	J
3.	UNKNOWN HYDROCARBON	6.43	170	J
4.	UNKNOWN HYDROCARBON	6.90	99	J
5.	UNKNOWN HYDROCARBON	7.05	3600	J
6.	UNKNOWN HYDROCARBON	8.38	500	J
7.	UNKNOWN HYDROCARBON	11.98	66	J
8.	UNKNOWN HYDROCARBON	12.75	66	J
9.	UNKNOWN CARBOXYLIC ACID ESTE	21.00	330	J

3/31/94

L091

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09Q6-TMA-681
VALIDATOR: [illegible]	LAB: TMA	DATE: 03/31/94
CASE:		SDG: B09Q6-TMA-681

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☒ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09DR4
B09DR5
B09DR6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

092

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments: The MS/MSD %R for 4-nitrophenol were 72% and 22%, respectively. Therefore, assoc. results have been qualified as estimated (UJ).

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes (No) N/A

Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)

Are field split RPD values acceptable? . . . . . Yes No (N/A)

Comments: MS/MSD RPD for 4-nitrophenol is 111%. However, since all assoc. results are nondetects, no qualification is required.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . (Yes) No N/A

Are internal standard areas acceptable? . . . . . (Yes) No N/A

Are internal standard retention times acceptable? . . . . . (Yes) No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . (Yes) No N/A

Is compound quantitation acceptable? . . . . . (Yes) No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are all results supported in the raw data? . . . . . (Yes) No N/A

Do results meet the CRQLs? . . . . . (Yes) No N/A

Has the laboratory properly identified and coded all TIC? . . . (Yes) No N/A

Comments:

094

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Sample locations are not currently available but will be evaluated in the final summary report.

095

HOLDING TIME SUMMARY

B090Q6-TMA-681

SDG:	VALIDATOR:	DATE: 3/31/94	PAGE 1 OF 1
COMMENTS: Semivolatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DR4	BNA	12/16/93	12/29/93	01/20/94	13	22	None
B09DR5	↓	12/16/93	↓	↓	13	↓	↓
B09DR6	↓	12/20/93	↓	↓	9	↓	↓

9713517.1551

~~000484~~

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1229S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-BLK

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 40120I02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	75	J XFD=750
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	85	J XLC=850
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

4/4/94

9713517.1352

~~000485~~

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK1229S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A312051-BLK

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 40120I02

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/29/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 01/20/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

Number TICs found: 16

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.17	200	J
2.	UNKNOWN HYDROCARBON	5.50	130	J
3.	UNKNOWN HYDROCARBON	5.63	230	J
4.	UNKNOWN HYDROCARBON	5.73	67	J
5.	UNKNOWN HYDROCARBON	6.10	270	J
6.	UNKNOWN GLYCOL ETHER	6.23	5300	J
7.	UNKNOWN HYDROCARBON	6.40	67	J
8.	UNKNOWN HYDROCARBON	6.57	500	J
9.	UNKNOWN HYDROCARBON	6.73	67	J
10.	UNKNOWN HYDROCARBON	7.50	700	J
11.	UNKNOWN HYDROCARBON	7.57	300	J
12.	UNKNOWN ALKENE	7.82	67	J
13.	UNKNOWN ALCOHOL	7.88	370	J
14.	UNKNOWN HYDROCARBON	8.88	100	J
15.	UNKNOWN HYDROCARBON	10.17	100	J
16.	UNKNOWN CARBOXYLIC ACID ESTE	19.83	330	J

4/4/94

9713517.1353

~~000300~~

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

e: TMA/ARLI Contract: WHC

e: TMALA Case No.: 12051 SAS No.: NA SDG No.: NA

Spike - EPA Sample No.: B09DR5 Level:(low/med) LOW

MPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
nol	2570	0	1875	73	26- 90
hlorophenol	2570	0	1971	77	25-102
-Dichlorobenzene	1710	0	1100	64	28-104
Nitroso-di-n-prop.(1)	1710	0	1199	70	41-126
2,4-Trichlorobenzene	1710	0	1165	68	38-107
Chloro-3-methylphenol	2570	0	750.5	29	26-103
enaphthene	1710	0	1210	71	31-137
-Nitrophenol	2570	0	168.6	7 *	11-114
,4-Dinitrotoluene	1710	0	1278	75	28- 89
entachlorophenol	2570	0	2108	82	17-109
yrene	1710	0	1436	84	35-142

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	2590	2038	79	8	35	26- 90
2-Chlorophenol	2590	2172	84	9	50	25-102
1,4-Dichlorobenzene	1720	1165	68	6	27	28-104
N-Nitroso-di-n-prop.(1)	1720	1379	80	13	38	41-126
1,2,4-Trichlorobenzene	1720	1283	75	10	23	38-107
4-Chloro-3-methylphenol	2590	768.9	30	3	33	26-103
Acenaphthene	1720	1269	74	4	19	31-137
4-Nitrophenol	2590	53.44	2 *	111 *	50	11-114
2,4-Dinitrotoluene	1720	1358	79	5	47	28- 89
Pentachlorophenol	2590	2183	84	2	47	17-109
Pyrene	1720	1507	88	5	36	35-142

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
Values outside of QC limits

PD: 1 out of 11 outside limits
pike Recovery: 2 out of 22 outside limits

OMMENTS: CLP,12051,,B09DR5,L,S,A312051-02B,B,EPA
CAP/.32,40120I01,4DFT0120I1,40120I02,40120I05,40120I06

1/14/94

-095

9213512.1354

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 5, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DQ6-TMA-681 (923-E418, Filename B09DQ6.GCH)

INTRODUCTION

This memo presents the results of data validation on data package B09DQ6-TMA-681 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DQ0	12/03/93	SOIL	SEE NOTE 1
B09DQ1	12/06/93	SOIL	
B09DQ6	12/09/93	SOIL	
B09DQ7	12/13/93	SOIL	
B09DQ8	12/13/93	SOIL	
B09DQ9	12/14/92	SOIL	
B09DR0	12/14/93	SOIL	
B09DR1	12/15/93	SOIL	
B09DR3	12/14/93	SOIL	
B09DR4	12/16/93	SOIL	
B09DR5	12/16/93	SOIL	
B09DR6	12/20/93	SOIL	
Note 1. All samples were analyzed for anions (chloride, fluoride, and sulfate) and nitrate+nitrite-N.			

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION SDLA

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of twelve samples were validated in this data package with a total of 48 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data as estimated.

Matrix Spike

- The matrix spike percent recovery (MS %R) for nitrate+nitrite-N was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

9713517.1356

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR:	DATE: April 5, 1994	PAGE 1 OF 1
COMMENTS: GENERAL CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NITRATE+NITRITE-N	J	B09DQ7 B09DQ8 B09DQ9 B09DR0 B09DR1 B09DR3	MS %R > 125%

9713517.1360

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ0		B09DQ1		B09DQ6		B09DQ7		B09DQ8		B09DQ9	
	Date	12-3-93		12-6-93		12-9-93		12-13-93		12-13-93		12-14-93	
	Location	U-8 CRIB		U-8 CRIB		U-1 CRIB		U-1 CRIB		U-8 CRIB		U-8 CRIB	
	Depth	4.00 - 6.00		15.50 - 17.50		40.50 - 42.50		50.00 - 52.00		38.00 - 40.00		48.00 - 50.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	8.200		15.200		11.500		7.600		5.500		4.000	
FLUORIDE	MG/KG	1.500		1.100		8.100		7.100		7.800		4.300	
SULFATE	MG/KG	13.000		40.000		30.000		16.000		14.000		9.000	
NITRATE+NITRITE	MG-N/KG	7.080		12.800		2.490	U	3.970	J	261.000	J	56.800	J

Verified
4/13/94

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Validated Data Summary, Data Package: B09D06-TMA-681

	Samp#	B09DR0		B09DR1		B09DR3		B09DR4		B09DR5		B09DR6	
	Date	12-14-93		12-15-93		12-14-93		12-16-93		12-16-93		12-20-93	
	Location	U-8 CRIB		U-1 CRIB		U-8 CRIB		U-1 CRIB		U-8 CRIB		U-1 CRIB	
	Depth	57.50 - 59.50		60.00 - 62.00		68.00 - 70.00		80.00 - 82.00		89.50 - 91.50		99.50 - 101.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	4.000		7.400		4.100		7.200		5.400		7.600	
FLUORIDE	MG/KG	2.600		4.900		2.500		0.800		3.000		3.400	
SULFATE	MG/KG	10.000		18.000		9.000		28.000		13.000		18.000	
NITRATE+NITRITE	MG-N/K	128.000	J	6.140	J	64.900	J	14.300		33.100		2.500	U

Verified

4/13/94

9415457.1302

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ0 FRACTION 02B TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/03/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	8.2	mg/kg	1.0
Fluoride	300.0	1.5	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

FORM I

Verified

4/01/94

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~~000010~~

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ1 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/06/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	15.2	mg/kg	1.0
Fluoride	300.0	1.1	mg/kg	0.5
Sulfate	300.0	40	mg/kg	5

FORM I

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4/01/94

TMA Inc. REPORT Work Order # A3-12-029

Received: 12/15/93

Results by Sample

SAMPLE ID B09DQ6 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/09/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	11.5	mg/kg	1.0
Fluoride	300.0	8.1	mg/kg	0.5
Sulfate	300.0	30	mg/kg	5

FORM I

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4/4/94

9713517.1366

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

~~000011~~

SAMPLE ID B09DQ7 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/13/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	7.6	mg/kg	1.0	
Fluoride	300.0	7.1	mg/kg	0.5	
Sulfate	300.0	16	mg/kg	5	

FORM I

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4/13/94

9713517.1367

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

~~000012~~

SAMPLE ID B09DQ8 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/13/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	5.5	mg/kg	1.0	
Fluoride	300.0	7.8	mg/kg	0.5	
Sulfate	300.0	14	mg/kg	5	

FORM I

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4/13/94

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TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

~~000013~~

SAMPLE ID B09DQ9 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/14/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	4.0	mg/kg	1.0	
Fluoride	300.0	4.3	mg/kg	0.5	
Sulfate	300.0	9	mg/kg	5	

FORM I

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4/13/94

9713517.1369

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample

~~000014~~

SAMPLE ID B09DR0 FRACTION 04C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/14/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	4.0	mg/kg	1.0	
Fluoride	300.0	2.6	mg/kg	0.5	
Sulfate	300.0	10	mg/kg	5	

FORM I

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4/13/94

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample ~~000016~~

SAMPLE ID B09DR1 FRACTION 06C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/15/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	Q
Chloride	300.0	7.4	mg/kg	1.0	
Fluoride	300.0	4.9	mg/kg	0.5	
Sulfate	300.0	18	mg/kg	5	

FORM I

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TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

~~000015~~

SAMPLE ID B09DR3 FRACTION 05C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/15/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.1	mg/kg	1.0
Fluoride	300.0	2.5	mg/kg	0.5
Sulfate	300.0	9	mg/kg	5

FORM I

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4/4/94

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93 Results by Sample

SAMPLE ID B09DR4 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/16/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.2	mg/kg	1.0
Fluoride	300.0	0.8	mg/kg	0.5
Sulfate	300.0	28	mg/kg	5

FORM I

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3/30/94

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR5 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/16/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	5.4	mg/kg	1.0
Fluoride	300.0	3.0	mg/kg	0.5
Sulfate	300.0	13	mg/kg	5

FORM I

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3/30/94

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR6 FRACTION 03C TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 12/20/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	7.6	mg/kg	1.0
Fluoride	300.0	3.4	mg/kg	0.5
Sulfate	300.0	18	mg/kg	5

FORM I

3/30/94

Received: 12/09/93 Results by Sample

SAMPLE ID B09D00 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 7.08
mg N/kg

SAMPLE ID B09D01 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 12.8
mg N/kg

SAMPLE ID B09D01D SAMPLE # 02 FRACTIONS: B
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 12.5
mg N/kg

SAMPLE ID B09D01S SAMPLE # 02 FRACTIONS: C
Date & Time Collected 12/06/93 09:55:00 Category SOIL

NITR_S 31.8
mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

Verified
4/04/94

TMA Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4LAB TEST FAX (617) 890-3893

9213517.1576

 Skinner&Sherman REPORT Work Order # S3-12-148

Received: 12/16/93 Results by Sample

SAMPLE ID B09D06 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/09/93 Category SOIL

NITR_S <2.49
mg N/kg

SAMPLE ID B09D06D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 12/09/93 Category SOIL

NITR_S <2.50
mg N/kg

SAMPLE ID B09D06S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 12/09/93 Category SOIL

NITR_S 22.4
mg N/kg

SAMPLE ID LCSS SAMPLE # 02 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.07
mg N/L

verified
4/13/94

023

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TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200

9713517.1377

Received: 12/21/93 Results by Sample

SAMPLE ID B09DR0 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/14/93 Category SOIL

NITR_S 128
mg N/kg

SAMPLE ID B09DR1 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/15/93 Category SOIL

NITR_S 6.14
mg N/kg

SAMPLE ID B09DR3 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/14/93 Category SOIL

NITR_S 64.9
mg N/kg

SAMPLE ID B09DQ7 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 12/13/93 Category SOIL

NITR_S 3.97
mg N/kg

SAMPLE ID B09DQ8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 12/13/93 Category SOIL

NITR_S 261
mg N/kg

SAMPLE ID B09DQ9 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 12/12/14 Category SOIL

NITR_S 56.8
mg N/kg

SAMPLE ID B09DQ9D SAMPLE # 06 FRACTIONS: B
Date & Time Collected 12/12/14 Category SOIL

NITR_S 59.5
mg N/kg

Verified 4/4/94 024

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submittec invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are no analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-720(

9713517.1378

Received: 12/23/93 Results by Sample

SAMPLE ID B09DR4 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/16/93 Category SOIL

NITR_S 14.3
mg N/kg

SAMPLE ID B09DR5 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/16/93 Category SOIL

NITR_S 33.1
mg N/kg

SAMPLE ID B09DR6 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/16/93 Category SOIL

NITR_S <2.50
mg N/kg

SAMPLE ID B09DR6D SAMPLE # 03 FRACTIONS: B
Date & Time Collected 12/16/93 Category SOIL

NITR_S <2.50
mg N/kg

SAMPLE ID B09DR6S SAMPLE # 03 FRACTIONS: C
Date & Time Collected 12/16/93 Category SOIL

NITR_S 20.8
mg N/kg

SAMPLE ID LCSS SAMPLE # 04 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S ~~2.07~~ 2.04
mg N/L

4/04/94

Verified
4/13/94

:025

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TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-720

9713517.1379

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

GENERAL CHEMISTRY RESULTS

CASE NO. 12-010

Soil Sample #s:

B09DQ0 B09DQ1

CASE NARRATIVE

No problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish

Maureen Parrish

GENERAL CHEMISTRY RESULTS

CASE NO. 12-029

Solid Sample #:

B09DQ6

CASE NARRATIVE

In sample B09DQ6 a peak was detected at approximately 1.1 minutes which is believed to be acetate. In accordance with method 300.0, the sample was reanalayzed with the same results and a Martix Spike was performed that identifies and quantifies Fluoride. Since the blanks, the calibration verification standards and the LCS does not contain this peak, it is believed to be derived from the sample. No further action was performed even though the Relative Percent Difference between the sample and the duplicate exceeded the control criteria. All runs on this sample have been included in the raw data section of the package.

No problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish

Maureen Parrish

GENERAL CHEMISTRY RESULTS

CASE NO. 12-044

Solid Sample #s:

B09DQ7	B09DQ8
B09DQ9	B09DR0
B09DR1	~~B09DR2~~
B09DR3	

4/13/94

CASE NARRATIVE

In all the samples a peak was detected at approximately 1.1 minutes. The additional peak appears to be acetate. Since the blanks, the calibration verification standards and the LCS do not contain this peak, it reconfirms the peak is due to the sample. As a result of the coelution, the percent RPD between sample B09DR0 and the duplicate was 32.3 percent.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 2/22/94

Maureen Parrish

GENERAL CHEMISTRY RESULTS

CASE NO. 12-051

Solid Sample #:

B09DR4 B09DR5
B09DR6

CASE NARRATIVE

In samples B09DR4, B09DR5, and B09DR6 a peak which is believed to be acetate was detected at approximately 1.1 minutes. The matrix spike on sample B09DR4 reconfirmed the position of Fluoride and the continuing presence of the unidentified peak. Since the blanks, the calibraiton verification standards and the LCS do not contain this peak, it is believed to be derived from the sample.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 5/22/94

Maureen Parrish

9713517.1384

4/4/94

B09001, ~~B09022~~ B09000

Received: 12/09/93 Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200

Received: 12/16/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

B09D26

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200

Received: 12/21/93 Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

B09Q7
B09Q8
B09Q9
B09R0
B09R1
B09R3

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submittec invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was mad and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwis in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are no analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrange ments. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-720(

Received: 12/23/93

Test Methodology

TEST CODE NITR_S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

B09DR4
B09DR5
B09DR6

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitte invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was mad and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwis in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are nc analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrange ments. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-720

9213512.1388

~~0000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-03-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 99733229 1 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~
~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-03-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Lorene E. Rogers 12-07-93	J.D. Fowler	12/7/93 1309
Relinquished by: 12/7/93 J.D. Fowler 1335	Received by: H. NARCISO	Date/Time: 12-08-93 1:00 P.M
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1389

000002C

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-06-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322291

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

HR 12-06-93

3)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

HR 12-06-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 John C Rogers 12-7-93	J.D. Fankhev J.D. Fankhev	12/7/93 1305
Relinquished by: J.D. Fankhev J.D. Fankhev 12/7/93 1335	Received by: Jessica Dze/H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1390

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-09-93

Ice Chest No.: SML-437 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

12-09-93

3)

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Karen E. Rogers 0950	[illegible]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1391

000002G

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Laurie E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

038

9213517.1392

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-13-93

Ice Chest No. — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No. — Offsite Property No.

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) BORDQ8

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
8945 Doreen Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

039

9213512.1393

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No.: — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09D29

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09D20

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml ~~P:CLP;TAL~~ Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Gorene E. Page 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

040

9713517.1394

000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-15-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- ~~1,250ml aG:Semi-VOA CLP~~
- ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- ~~1,125ml G:Cyanide CLP~~
- ~~1,125ml Gw:Kerosene (8015M)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

~~3) B04~~

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-14-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 Loren E. Rogers 1200	W. V. Seltzer	12-17-93 1200
Relinquished by: W. V. Seltzer	Received by: [illegible]	Date/Time: 12-20-93 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Rec'd Saturday 12-18-93 but opened 12-20-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

041

9213512.1395

000002C

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No. — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No. — Offsite Property No.

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DR3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

042

9213517.1596

000021

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8217 — Offsite Property No.: W92-D-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) 302DR4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 Lorene Rogers 0845	[signature]	12-21-93 0845
Relinquished by: [signature]	Received by: [signature]	Date/Time: 12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1397

~~C000020~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Fan

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML-410 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1)

BOTORS

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/16/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Loren Rogers 12-21-93	Kenis	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1398

000002E

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-20-93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217

Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

HER 12-20-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845	W.V. Seltzer	12-21-93 0846
W.V. Seltzer	[illegible]	12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

045

9713517.1399

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE: B09026-TMA-681	
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/01/94
CASE:	SDG: B09026-TMA-681	

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09020

B09021

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? Yes No N/A

Are initial calibration results acceptable? . . . . . Yes No N/A

Was a calibration check performed for all applicable analyses? Yes No N/A

Are calibration check results acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . Yes No N/A

Are spike recoveries acceptable? . . . . . Yes No N/A

Were LCS analyses performed at the required frequency? . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments:

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes No N/A

Are laboratory duplicate sample RPD values acceptable? . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

L048

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR:	DATE: 4/4/94	PAGE 1 OF 1

COMMENTS: General Chemistry

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DQ0	NO_2/NO_3	12/3/93		12/21/93		18	None
B09DQ1	NO_2/NO_3	12/6/93		↓		15	↓
B09DQ0	Anions	12/3/93		12/21/93		18	None
B09DQ1	Anions	12/6/93		↓		15	↓

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2	DATA PACKAGE:	
VALIDATOR:	LAB:	DATE:
CASE:	SDG:	

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soil

B09Q6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

L051

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? Yes No N/A
Are initial calibration results acceptable? . . . . . Yes No N/A
Was a calibration check performed for all applicable analyses? Yes No N/A
Are calibration check results acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . Yes No N/A
Are spike recoveries acceptable? . . . . . Yes No N/A
Were LCS analyses performed at the required frequency? . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments:

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes No N/A
Are laboratory duplicate sample RPD values acceptable? . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

052

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09D96-TMA-681

SDG:	VALIDATOR:	DATE: 4/4/94	PAGE 1 OF 1
COMMENTS: General Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D96	Anions	12/9/93		12/21/93		12	None
B09D96	NO_2/NO_3	12/9/93		12/21/93		12	None

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09D26-TMA-681	
VALIDATOR: [illegible]	LAB: TMA		DATE: 04/01/94
CASE:		SDG: B09D26-TMA-681	

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09D81 B09D83

B09D87

B09D88

B09D89

B09D80

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? (Yes) No N/A

Are initial calibration results acceptable? . . . . . (Yes) No N/A

Was a calibration check performed for all applicable analyses? (Yes) No N/A

Are calibration check results acceptable? . . . . . (Yes) No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . Yes No (N/A)

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . (Yes) No N/A

Are spike recoveries acceptable? . . . . . ~~Yes~~ (No) N/A (J) 4/4/93

Were LCS analyses performed at the required frequency? . . . . (Yes) No N/A

Are LCS recoveries acceptable? . . . . . (Yes) No N/A

Comments: MS%R for NO_2/NO_3 is 126.3%, > 125%. Assoc results have been qualified as estimated (J).

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . (Yes) No N/A

Are laboratory duplicate sample RPD values acceptable? . . . . (Yes) No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)

Are field split RPD values acceptable? . . . . . Yes No (N/A)

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

4/4/94

~~B09D26~~ B09D26-TMA 681

HOLDING TIME SUMMARY

SDG:	VALIDATOR:	DATE: 4/4/94	PAGE 1 OF 1
COMMENTS: General Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D27	Anions	12/13/93		01/07/94		25	None
B09D28		12/13/93				25	
B09D29		12/14/93				24	
B09D30		12/14/93				24	
B09D31		12/15/93				23	
B09D33		12/14/93				24	
B09D27	NO_2/NO_3	12/13/93		01/05/94		23	None
B09D28		12/13/93				23	
B09D29		12/14/93				22	
B09D30		12/14/93				22	
B09D31		12/15/93				21	
B09D33		12/14/93				22	

9713517.1412

Received: 12/21/93 02/02/94 09:12:53

TMA/NORCAL Hanford

Q U A L I T Y C O N T R O L

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S312193-01	56.8 mg/kg	19.8 mg/kg	81.9 mg/kg	126.8

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S312193-01	56.8 mg/kg	59.9 mg/kg	4.6

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.04 mg/L	102.0
Prep blank	--	<0.25 mg/L	--

Qualify positive sample results as estimated (J).

4/4/94

059

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitte invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was mad and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwis in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are no analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrange ments. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-720

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09Q6-TMA-681	
VALIDATOR: [illegible]	LAB: TMA	DATE: 04/04/94	
CASE:		SDG: B09Q6-TMA-681	

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soils

B09R4
B09R5
B09R6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? Yes No N/A
Are initial calibration results acceptable? . . . . . Yes No N/A
Was a calibration check performed for all applicable analyses? Yes No N/A
Are calibration check results acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . Yes No N/A
Are spike recoveries acceptable? . . . . . Yes No N/A
Were LCS analyses performed at the required frequency? . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments: The LCS result was corrected from 2.07 mg/L to 2.04 mg/L, the actual percent recovery is 102%. No qualification is required.

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes No N/A
Are laboratory duplicate sample RPD values acceptable? . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

061

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09D26-TMA-681

SDG:	VALIDATOR:	DATE: 4/4/94	PAGE 1 OF 1
COMMENTS: General Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED 4/4/94	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DR4	NO2/NO3	12/16/93		1/05/94		20	None
B09DR5	↓	12/16/93		↓		20	↓
B09DR6	↓	12/20/93		↓		16	↓
B09DR4	Anions	12/16/93		1/11/94		26	None
B09DR5	↓	12/16/93		↓		26	↓
B09DR6	↓	12/20/93		↓		22	↓

9413517.1417

MEMORANDUM

APR 1994
RECEIVED
TQO

TO: 200-UP-2 Project QA Record

April 5, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DQ6-TMA-681 (923-E418, Filename B09DQ6.GC)

INTRODUCTION

This memo presents the results of data validation on data package B09DQ6-TMA-681 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DQ0	12/03/93	SOIL	SEE NOTE 1
B09DQ1	12/06/93	SOIL	
B09DQ6	12/09/93	SOIL	
B09DQ7	12/13/93	SOIL	
B09DQ8	12/13/93	SOIL	
B09DQ9	12/14/92	SOIL	
B09DR0	12/14/93	SOIL	
B09DR1	12/15/93	SOIL	
B09DR3	12/14/93	SOIL	
B09DR4	12/16/93	SOIL	
B09DR5	12/16/93	SOIL	
B09DR6	12/20/93	SOIL	
Note 1. All samples were analyzed for kerosene according to the 8015 Modified method.			

RECEIVED
APR 1 1994
VALIDATION DOCUMENT
SDLA

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of twelve samples were validated in this data package with a total of 12 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data as estimated.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

9713517.1419

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9713517.1421

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR:	DATE: April 5, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC AS KEROSENE			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION REQUIRED			

9713517.1423

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ0		B09DQ1		B09DQ6		B09DQ7		B09DQ8		B09DQ9	
	Date	12-3-93		12-6-93		12-9-93		12-13-93		12-13-93		12-14-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
KEROSENE	MG/KG	5.000	U	5.000	U	11000.000		5.000	U	8800.000		6400.000	

Verified
4/04/94

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DR0		B09DR1		B09DR3		B09DR4		B09DR5		B09DR6	
	Date	12-14-93		12-15-93		12-14-93		12-16-93		12-16-93		12-20-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
KEROSENE	MG/KG	3500.000		5.000	U	43.000		5.000	U	1026.000		22.000	

Verified
[illegible] 4/04/94

9713517.1426

~~000407~~

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ0 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/03/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 12/30/93
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5	u
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified 4/01/94

010

9713517.1427

~~000409~~

TMA Inc. REPORT Work Order # A3-12-010

Received: 12/08/93

Results by Sample

SAMPLE ID B09DQ1 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/06/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 12/30/93
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified

4/01/94

011

9713517.1428

~~000348~~

TMA Inc. REPORT Work Order # A3-12-029

Received: 12/15/93

Results by Sample

SAMPLE ID B09DQ6 FRACTION 01J TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/09/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	11000	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

Verified

4/01/94

9213517.1429

~~000770~~

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample

SAMPLE ID B09DQ7 FRACTION 01F TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/13/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

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3/30/94

9713517.1430

~~000773~~

Received: 12/20/93

TMA Inc. REPORT
Results by Sample

Work Order # A3-12-044

SAMPLE ID B09DQ8 FRACTION 02F TEST CODE 8015MS NAME EPA 8015M EXTRACT.
Date & Time Collected 12/13/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	8800	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

Verified
3/30/94

9713512.1431

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TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93

Results by Sample

SAMPLE ID B09DQ9 FRACTION 03E TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/14/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	6400	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

Verified

3/30/94

9213517.1432

~~000781~~

Received: 12/20/93

TMA Inc. REPORT
Results by Sample

Work Order # A3-12-044

SAMPLE ID B09DR0

FRACTION 04F TEST CODE 8015MS NAME EPA 8015M EXTRACT.
Date & Time Collected 12/14/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 50.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	3500	250
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

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3/30/94

TMA Inc. REPORT Work Order # A3-12-044

Received: 12/20/93 Results by Sample

SAMPLE ID B09DR1 FRACTION 06D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/15/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5.0	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified
3/30/94

9713512.1434

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Received: 12/20/93

TMA Inc. REPORT
Results by Sample

Work Order # A3-12-044

SAMPLE ID B09DR3 FRACTION 05E TEST CODE 8015MS NAME EPA 8015M EXTRACT.
Date & Time Collected 12/15/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/21/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	43	5.0
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

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3/30/94

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR4 FRACTION 01G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/16/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/06/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL	Q
Kerosene Range	ND	5	U
C10 - C16 Jet Fuel Range	NA	NA	
C9 - C22 Diesel Range	NA	NA	
Hydraulic Range	NA	NA	

ND = Not detected at the specified limits

Form I

Verified
3/30/94

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93

Results by Sample

SAMPLE ID B09DR5 FRACTION 02G TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/16/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/07/94
Dilution factor: 5.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	1026	25
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

Verified
3/30/94

TMA Inc. REPORT Work Order # A3-12-051

Received: 12/22/93 Results by Sample

SAMPLE ID B09DR6 FRACTION 03D TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 12/20/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 01/06/94
Dilution factor: 1.00
Concentration Units: mg/Kg

Compound	Sample Result	PQL
Kerosene Range	22	5
C10 - C16 Jet Fuel Range	NA	NA
C9 - C22 Diesel Range	NA	NA
Hydraulic Range	NA	NA

ND = Not detected at the specified limits

Form I

Verified

3/30/94

9713517.1458

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-010

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 8, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP9	A3-12-010-01A	V	SOIL
B09DP9 MS	A3-12-010-01B	V	SOIL
B09DP9 MSD	A3-12-010-01C	V	SOIL
B09DQ0	A3-12-010-02A	V	SOIL
B09DQ0	A3-12-010-02B	SV	SOIL
B09DQ0 MS	A3-12-010-02C	SV	SOIL
B09DQ0 MSD	A3-12-010-02D	SV	SOIL
B09DQ0	A3-12-010-02G	K	SOIL
B09DQ1	A3-12-010-03A	V	SOIL
B09DQ1	A3-12-010-03B	SV	SOIL
B09DQ1	A3-12-010-03E	K	SOIL
B09DQ1 MS	A3-12-010-03F	K	SOIL
B09DQ1 MSD	A3-12-010-03G	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Low concentrations of Di-n-Butylphthalate were detected in the blank and all the samples that were tested for semivolatiles.

The surrogate recovery for Terphenyl-d14 on sample B09DQ0MSD, was above the contract required QC limits. In accordance with CLP protocol no further action was taken.

The spike recoveries for sample B09DQ0MSD, were above the QC limits for Phenol, 4-Nitrophenol, and 2,4-Dinitrotoluene. The results for 4-Nitrophenol have been "E" qualified since the actual concentration detected in the MSD exceeded the calibration of the instrument. The %RPD for 1,2,4-Trichlorobenzene and Acenaphthene were slightly above the QC limits. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst a series of samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

No Kerosene was detected in any of the samples. Sample B09DQ1 was spiked with Kerosene. The matrix spike recoveries were 69% and 70%. The blank spike was prepared at the same time and had an 72% recovery.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish

Maureen Parrish 1/21/94
Project Manager

~~000075~~

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-029

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 15, 1993

1.0 DESCRIPTION OF CASE :

One soil sample was analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ6	A3-12-029-01A	V	SOIL
B09DQ6 MS	A3-12-029-01B	V	SOIL
B09DQ6 MSD	A3-12-029-01C	V	SOIL
B09DQ6	A3-12-029-01D	SV	SOIL
B09DQ6 MS	A3-12-029-01E	SV	SOIL
B09DQ6 MSD	A3-12-029-01F	SV	SOIL
B09DQ6	A3-12-029-01J	K	SOIL
B09DQ6 MS	A3-12-029-01K	K	SOIL
B09DQ6 MSD	A3-12-029-01L	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the sample was analyzed as a medium-level soil. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner.

All of the QC results were within the limits specified by the EPA CLP SOW.

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TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the sample was concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the sample was performed by the analyst prior to injection. The large dilution was necessary based on the viscous nature of the extract. The matrix spikes and surrogates were not recoverable due to the large sample dilution. The blank, SBLK1217S2, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL. A 1:50 dilution was performed on the sample by the analyst prior to injection.

The matrix spiking solution was added at a concentration of approximately 240 ppm. Due to the large concentration of Kerosene in the sample, an accurate recovery of the matrix spiking compounds could not be obtained. The blank spike had

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a 66% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the results were reported on a wet weight basis.

All of the other QC results were within the limits specified by the SW-846 Method 8015M.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designee, as verified by the following signature.

Maureen Parrish 2/17/94
Maureen Parrish
Project Manager

~~000083~~

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-044

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 20, 1993

1.0 DESCRIPTION OF CASE :

Seven soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DQ7	A3-12-044-01A	V	SOIL
B09DQ7 MS	A3-12-044-01B	V	SOIL
B09DQ7 MSD	A3-12-044-01C	V	SOIL
B09DQ7	A3-12-044-01D	SV	SOIL
B09DQ7	A3-12-044-01F	K	SOIL
B09DQ8	A3-12-044-02A	V	SOIL
B09DQ8	A3-12-044-02B	SV	SOIL
B09DQ8 MS	A3-12-044-02C	SV	SOIL
B09DQ8 MSD	A3-12-044-02D	SV	SOIL
B09DQ8	A3-12-044-02F	K	SOIL
B09DQ9	A3-12-044-03A	V	SOIL
B09DQ9	A3-12-044-03B	SV	SOIL
B09DQ9	A3-12-044-03E	K	SOIL
B09DR0	A3-12-044-04A	V	SOIL
B09DR0 MS	A3-12-044-04G	V	SOIL
B09DR0 MSD	A3-12-044-04H	V	SOIL
B09DR0	A3-12-044-04B	SV	SOIL
B09DR0	A3-12-044-04F	K	SOIL
B09DR3	A3-12-044-05A	V	SOIL
B09DR3	A3-12-044-05B	SV	SOIL
B09DR3	A3-12-044-05E	K	SOIL
B09DR3 MS	A3-12-044-05F	K	SOIL
B09DR3 MSD	A3-12-044-05G	K	SOIL
B09DR1	A3-12-044-06A	V	SOIL
B09DR1	A3-12-044-06B	SV	SOIL
B09DR1	A3-12-044-06D	K	SOIL
B09DR2	A3-12-044-07A	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times.

Hexane was detected as a TIC (tentatively identified compound) in samples B09DR1, B09DR2, and the blank, VBLK1223R.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DQ8, B09DQ9, and B09DR0. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR0MS and B09DR0MSD were within the QC limits.

All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

Due to problems with the matrix, the samples B09DQ8, B09DQ8MS, and B09DQ8MSD, were concentrated to 1 mL instead of the normal 0.5 mL. In addition, a 1:40 dilution of the same samples were performed by the analyst prior to injection. For sample B09DR0, a 1:20 dilution was performed by the analyst prior to

injection. The large dilutions were necessary based on the viscous nature of the extracts.

The matrix spikes and surrogates were not recoverable for samples B09DQ8, B09DQ8MS, and B09DQ8MSD, due to the large dilutions. The blank, SBLK1223S2, and samples B09DQ7, B09DQ9, B09DR1, and B09DR3, did not require any dilutions, and therefore the surrogate recoveries were within the QC limits. For sample B09DR0, all of the surrogates were diluted out, with the exception of 2-Fluorobiphenyl, Terphenyl-d14, and 1,2-Dichlorobenzene-d4; 2-Chlorophenol-d4 was not diluted out, although the recoveries were still below the QC limits.

In samples B09DQ7, B09DQ9, B09DR1, B09DR3, and SBLK1223S2, the compound 4-Hydroxy-4-methyl-2-pentanone was detected as a Aldol condensation TIC, and therefore "A" qualified. There were several other TICs detected in each sample. In addition, both Diethylphthalate and Di-n-butylphthalate were detected below the CRQL in samples B09DQ7, B09DQ9, B09DR1, B09DR3, and in the blank. In all of the samples, with the exception of sample B09DQ7, the compound Phosphoric Acid Tributyl Ester was detected as a TIC and "N" qualified.

All of the other QC results were within the limits specified by the EPA CLP SOW.

3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 01/19/94 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 950ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

A 1:50 dilution of samples B09DQ8, B09DQ9, and B09DR0, was performed in order to bring the results within the linear range of the instrument. Sample B09DR3 was spiked with Kerosene. The matrix spike recoveries ranged from 67% to 68%.

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The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth
Nicole Roth 2/23/94
Program Manager

Maureen Parrish
Maureen Parrish 2/22/94
Project Manager

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CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 12-051

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : December 22, 1993

1.0 DESCRIPTION OF CASE :

Three soil samples were analyzed for TCL Organics- Volatiles and Semivolatiles according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision OLM01.8. The Extractable Hydrocarbons for Kerosene (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DR4	A3-12-051-01A	V	SOIL
B09DR4 MS	A3-12-051-01B	V	SOIL
B09DR4 MSD	A3-12-051-01C	V	SOIL
B09DR4	A3-12-051-01D	SV	SOIL
B09DR4	A3-12-051-01G	K	SOIL
B09DR5	A3-12-051-02A	V	SOIL
B09DR5 MS	A3-12-051-02H	V	SOIL
B09DR5 MSD	A3-12-051-02I	V	SOIL
B09DR5	A3-12-051-02B	SV	SOIL
B09DR5 MS	A3-12-051-02C	SV	SOIL
B09DR5 MSD	A3-12-051-02D	SV	SOIL
B09DR5	A3-12-051-02G	K	SOIL
B09DR6	A3-12-051-03A	V	SOIL
B09DR6	A3-12-051-03B	SV	SOIL
B09DR6	A3-12-051-03D	K	SOIL
B09DR6 MS	A3-12-051-03E	K	SOIL
B09DR6 MSD	A3-12-051-03F	K	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed, with the required QC, by heated purge within the CLP SOW holding times.

The analyte Toluene was detected below the CRQL in samples B09DR4, B09DR6, and the blank, VBLK1229R. In addition, Hexane was detected as a TIC (tentatively identified compound) in samples B09DR4 and B09DR6.

All of the QC results were within the limits specified by the EPA CLP SOW.

MEDIUM LEVEL SOIL :

The samples were analyzed, with the required QC, within the CLP SOW holding times.

Due to the high concentration of TIC compounds, the following samples were analyzed as a medium-level soils: B09DR5, B09DR5MS, and B09DR5MSD. After the sample was extracted and diluted, the surrogates were added. The matrix spike samples were handled in the same manner. All of the matrix spike recoveries for sample B09DR5MS and B09DR5MSD were within the QC limits. The surrogate 1,2-Dichloroethane-d4 had a recovery above the QC limits in sample B09DR5MSD.

All of the other QC results were within the limits specified by the EPA CLP SOW.

TUNES :

All BFB tunes were injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the contract required holding times.

In samples B09DR4, B09DR5, B09DR6, and B09DR5MSD, Diethylphthalate, Di-n-butylphthalate, and bis(2-Ethylhexyl)phthalate were detected at concentrations less than the CRQL. Only Diethylphthalate and Di-n-butylphthalate were detected in sample B09DR5MS and in the blank, SBLK1229S2, below the CRQL.

The matrix spikes recoveries for 4-Nitrophenol were below the QC limits in samples B09DR5MS and B09DR5MSD. In accordance with the protocol, no further action was required.

All of the other QC results were within the limits specified by the EPA CLP SOW.

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3.2.3 EXTRACTABLE HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/18/93 and was analyzed according to the SW-846 Method 8015M. The initial calibration consisted of 5 different levels of the Kerosene standard that ranged from 200ppm to 2000ppm. The continuing calibration at approximately 1000ppm was injected amongst the samples, in order to verify the instrument stability. The %RSD in the initial calibration and the %D in the continuing calibration were below their 20% and 15% limits, respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the required holding times. Approximately 20 g of each sample was extracted and concentrated to 5 mL.

Kerosene was detected in samples B09DR5 and B09DR6. Sample B09DR6 was spiked with Kerosene, and the matrix spike recoveries were 71% for the MS, and 57% for the MSD. The blank spike was prepared at the same time and had a 70% recovery, and the data was included in the "Additional Raw Data" portion of the package.

All of the QC results were within the limits specified by the SW-846 Method 8015M.

We certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this hardcopy data package and in the computer-readable data submitted on diskette is authorized by the Laboratory Manager or his designees, as verified by the following signatures.

Nicole Roth 2/23/94
Nicole Roth
Program Manager

Maureen Parrish 2/22/94
Maureen Parrish
Project Manager

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-03-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 997332291 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-03-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Lorene E. Rogers 12-07-93	J.D. Fowler J.D. Fowler	12/7/93 1309
Relinquished by: 12/7/93 J.D. Fowler J.D. Fowler 1335	Received by: H. NARCISO	Date/Time: 12-08-93 1:00 P.M
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

036

9213512.1453

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-06-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322291 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

HER 12-06-93

~~3)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

HER 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and ~~Print~~ Names)

Relinquished by:	Received by:	Date/Time:
1305 Joseph Rogers 12-7-93	J.D. Fambrough	12/7/93 1305
Relinquished by: J.D. Fambrough 12/7/93 1335	Received by: H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

L037

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713512.1454

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-09-93

Ice Chest No.: SML-437

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

12-09-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Loren E. Rogers 0950	[signature]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

038

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9413512.1455

~~000002G~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Leon E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 . KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1456

~~0000047~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ8

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0945 Doreen E Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1457

~~0000021~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No.: — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ9

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR0

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml ~~P:CLP;TAL~~ Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, ~~EP-71, EP-5~~) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Lorene E. Page 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

041

9713517.1458

0000024

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-15-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
1,250ml Gs:VOA CLP
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3) ~~B09~~

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-14-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 1200		12-17-93 1200
Relinquished by:	Received by:	Date/Time:
		12-20-93 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Rec'd SATURDAY BUT opened 12-20-93 12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

042

9213512.1459

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No.: — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DR3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1460

~~000002~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217 — Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DR4

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 Lorene E. Rogers 0845	A.V. Selyer	12.21.93 0846
Relinquished by: A.V. Selyer	Received by: [illegible]	Date/Time: 12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

044

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1461

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Fanh

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML-410 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1)

BOTTLES

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/16/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Loren E. Rogers 12-21-93	Jenise	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

045

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1462

~~000002E~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-20-93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217 — Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

HOR 12-20-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845		12-21-93 0846
		12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1463

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9213517.1464

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09DQ6-TMA-681
VALIDATOR: [signature]	LAB: TMA	DATE: 04/01/94
CASE:		SDG: B09DQ6-TMA-681

ANALYSES PERFORMED

☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B09DQ0

B09DQ1

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

048

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments:

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A 4/7/94

Are MS/MSD recoveries acceptable? See following comment. Yes No ~~N/A~~

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

049

GENERAL GC DATA VALIDATION CHECKLIST

Comments: The MS & MSD %R are 70% and 69%, respectively. No qualification has been applied since laboratory control limits are not specified, and ~~in~~ limits, in general, ~~are~~ ≤ 50% to 150% is acceptable. Sample results are undetected.

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . . (Yes) No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)

Are field split RPD values acceptable? . . . . . Yes No (N/A)

Comments: ① MS/MSD RPD = 1%
② Sample locations are not currently available but will be evaluated in the final summary report.

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . (Yes) No N/A

Is compound quantitation acceptable? . . . . . (Yes) No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are all results supported in the raw data? . . . . . (Yes) No N/A

Do results meet the CRQLs? . . . . . (Yes) No N/A

Comments:

050

HOLDING TIME SUMMARY

B09D26-TMA-681

SDG:	VALIDATOR:	DATE: 4/01/94	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DQ0	GC as Kerosene	12/3/93	12/16/93	12/30/93	13	14	None
B09DQ1	↓	12/06/93	↓	12/30/93	10	14	↓

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09Q26-TMA-681	
VALIDATOR: [illegible]	LAB: TMA		DATE: 04/01/94
CASE:		SDG: B09Q26-TMA-681	

ANALYSES PERFORMED

☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B09Q26

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

052

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A 4/7/94

Are MS/MSD recoveries acceptable? See following comments. Yes No N/A (*)

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

053

4/7/94

GENERAL GC DATA VALIDATION CHECKLIST

Comments: MS & MSD %R ~~for~~ are -496% and 0%. due to high concentration of kerosene in the soil. However, since the sample result is greater than 4x spiked amount, no qualification is required.

6. PRECISION

4/6/94

Are MS/MSD sample RPD values acceptable? . . . . . Yes ~~No~~ ~~N/A~~ 4/7/94

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: MS/MSD RPD is 200%. However, since the ~~spit~~ sample result is > 4x spiked amt., no qualification is applied.

due to high concentration of kerosene in the sample.

7. COMPOUND IDENTIFICATION AND QUANTITATION

4/7/94

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Comments:

The CRQL for sample B09Q6 is 250 mg/kg instead of 5 mg/kg due to a 50 times dilution performed on the sample.

054

HOLDING TIME SUMMARY

B09DQ6-TMA-681

SDG:	VALIDATOR: [illegible]	DATE: 4/01/94	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DQ6	GC as Fuel Gas	12/09/93	12/23/93	01/21/94	14	29	None

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09Q6-TMA-681	
VALIDATOR: [signature]	LAB: TMA		DATE: 03/30/94
CASE:		SDG: B09Q6-TMA-681	

ANALYSES PERFORMED

☐ 8010	☒ 8015 Kerosene	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B09Q7 B09R1
B09Q8
B09Q9
B09R0
B09R3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD recoveries acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

GENERAL GC DATA VALIDATION CHECKLIST

Comments: MS/MSD %R are 67% and 68%, respectively. No qualification was required since specific lab control limits were not provided. Generally limits of 50%-150% for GC parameters is acceptable.

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report.

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Comments:

058

HOLDING TIME SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR: [illegible]	DATE: 3/30/94	PAGE 1 OF 1

COMMENTS: GC - Kerosene

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B-9DQ7	GC as Kerosene	12/13/93	12/23/93	01/21/94	10	29	None
B09DQ8	↓	12/13/93	↓	↓	10	↓	↓
B09DQ9	↓	12/14/93	↓	↓	9	↓	↓
B09DR0	↓	12/14/93	↓	↓	9	↓	↓
B09DR1	↓	12/15/93	↓	↓	8	↓	↓
B09DR3	↓	12/14/93	↓	↓	9	↓	↓

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GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09D26-TMA-681	
VALIDATOR: [illegible]	LAB: TMA		DATE: 03/30/94
CASE:		SDG: B09D26-TMA-681	

ANALYSES PERFORMED

☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soils

B09R4

B09R5

B09R6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

060

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the Final Summary report.

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD recoveries acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A 03/30/91

Are LCS recoveries acceptable? . . . . . Yes No N/A

061

GENERAL GC DATA VALIDATION CHECKLIST

Comments: MS/MSD %R are 71% and 57%, respectively. No qualification was required since specific lab control limits were not provided. Generally limits of 50% to 150% for GC parameters is acceptable.

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be included in the final summary report.

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09Q26-TMA-681

SDG:	VALIDATOR:	DATE: 3/30/94	PAGE 1 OF 1
COMMENTS: GC as kerosene			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09QR4	GC as kerosene	12/16/93	12/29/93	01/06/94	13	8	None
B09QR5	↓	12/16/93	↓	↓	13	↓	↓
B09QR6	↓	12/20/93	↓	↓	9	↓	↓

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MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

April 13, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09DQ6-TMA-681 (923-E418, Filename B09DQ6.MET)

INTRODUCTION

This memo presents the results of data validation on data package B09DQ6-TMA-681 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DQ0	12/03/93	SOIL	SEE NOTE 1
B09DQ1	12/06/93	SOIL	
B09DQ6	12/09/93	SOIL	
B09DQ7	12/13/93	SOIL	
B09DQ8	12/13/93	SOIL	
B09DQ9	12/14/92	SOIL	
B09DR0	12/14/93	SOIL	
B09DR1	12/15/93	SOIL	
B09DR3	12/14/93	SOIL	
B09DR4	12/16/93	SOIL	
B09DR5	12/16/93	SOIL	
B09DR6	12/20/93	SOIL	

Note 1. All samples were analyzed for CLP TAL metals, cyanide and titanium with the exception of sample B09DQ6 in which titanium was requested, however it was not analyzed.

RECEIVED APR 1 1994 VALIDATION DOCUMENTATION

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses with the exception of the titanium result for sample B09DQ6. The analysis of titanium was requested for sample B09DQ6, however, the result was not reported and the data package did not provide the titanium raw data for this sample. A total of twelve samples were validated in this data package with a total of 299 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data as estimated.

Holding Time

- Mercury and cyanide analyses were performed out of the required holding times. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Laboratory Blanks

- **Positive Blanks.** Antimony, beryllium, copper, nickel, sodium, silver, and thallium were detected at positive concentrations in the associated calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

- **Negative Blanks.** Arsenic was detected at a negative concentration in the preparation blank. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

Matrix Spike

- The matrix spike percent recoveries (MS %R) for manganese, antimony, arsenic, selenium, silver and barium were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Laboratory Duplicate

- The laboratory duplicate sample results for arsenic and barium were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

ICP Serial Dilution

- ICP serial dilution percent difference (%D) for calcium, potassium, sodium, and zinc were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR:	DATE: April 13, 1994	PAGE 1 OF 2
COMMENTS: METALS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
SILVER	U	B09DR0 B09DR1 B09DR3 B09DQ7 B09DQ8 B09DQ9	PRESENT IN CCB
COPPER	U	B09DR0 B09DR1 B09DR3 B09DQ7 B09DQ8 B09DQ9	PRESENT IN ICB AND CCB
MANGANESE	J	B09DR0 B09DR1 B09DR3 B09DQ7 B09DQ8 B09DQ9	MS %R < 30% BUT SAMPLE RESULTS ARE > IDL
CALCIUM	J	B09DR0 B09DR1 B09DR3 B09DQ7 B09DQ8 B09DQ9	ICP SERIAL DILUTION > 10% AND SAMPLE RESULTS >50xIDL
POTASSIUM	J	B09DR0 B09DR1 B09DR3 B09DQ7 B09DQ8 B09DQ9	ICP SERIAL DILUTION > 10% AND RESULT > 50xIDL
ANTIMONY	U	B09DR4 B09DR5 B09DR6	PRESENT IN ICB AND CCB
BERYLLIUM	U	B09DR4 B09DR5 B09DR6	PRESENT IN CCB
COPPER	U	B09DR4 B09DR5 B09DR6	PRESENT IN ICB, CCB, AND PREP. BLANK
NICKEL	U	B09DR4	PRESENT IN CCB
SILVER	U	B09DR4 B09DR5 B09DR6	PRESENT IN ICB
ANTIMONY	UJ	B09DR4 B09DR5 B09DR6	MS %R < 75% BUT > 30%
ARSENIC	J	B09DQ0 B09DQ1	DUPLICATE RESULT > ±2xCRDL AND RESULTS ARE <5xCRDL

DATA QUALIFICATION SUMMARY

SDG: B09DQ6-TMA-681	VALIDATOR:	DATE: April 13, 1994	PAGE 2 OF 2
COMMENTS: METALS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
BARIUM	J	B09DQ0 B09DQ1	DUPLICATE RPD > 35% AND RESULTS ARE >5xCRDL
MERCURY	J - DETECTS UJ - NONDETECTS	B09DQ7 B09DQ8	ANALYZED OUT OF HOLDING TIME
CYANIDE	UJ	B09DR4 B09DR5 B09DR6	ANALYZED OUT OF HOLDING TIME
ARSENIC	J	B09DQ6	PRESENT IN PREP BLANK AT A NEGATIVE CONCENTRATION
ARSENIC	J	B09DQ6	MS %R < 75% BUT > 30%
MANGANESE	J	B09DQ6	MS %R > 125%
SELENIUM	J	B09DQ6	MS %R < 30% BUT SAMPLE RESULT > IDL
SILVER	J	B09DQ6	MS %R < 75% BUT > 30%
SODIUM	BJ	B09DQ6	ICP SERIAL DILUTION %D >10% AND SAMPLE RESULT >50xIDL
ZINC	J	B09DQ0 B09DQ1 B09DQ6	ICP SERIAL DILUTION %D >10% AND SAMPLE RESULT > 50xIDL
ANTIMONY	UJ	B09DQ0 B09DQ1 B09DQ6	MS %R < 75% BUT > 30%
BARIUM	J	B09DQ0 B09DQ1	MS %R < 30% AND SAMPLE RESULTS > IDL
SODIUM	U	B09DQ0 B09DQ1	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
THALLIUM	U	B09DQ0 B09DQ1	PRESENT IN ICB AT A POSITIVE CONCENTRATION

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ0		B09DQ1		B09DQ6		B09DQ7		B09DQ8		B09DQ9	
	Date	12-3-93		12-6-93		12-9-93		12-13-93		12-13-93		12-14-93	
	Location	U-8 CRIB		U-8 CRIB		U-1 CRIB		U-1 CRIB		U-8 CRIB		U-8 CRIB	
	Depth	4.00 - 6.00		15.50 - 17.50		40.50 - 42.50		50.00 - 52.00		38.00 - 40.00		48.00 - 50.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	7400.000		7560.000		7570.000		4800.000		10700.000		5430.000	
ANTIMONY	MG/KG	2.700	UJ	2.700	UJ	2.800	UJ	2.500	U	2.700	U	2.400	U
ARSENIC	MG/KG	8.800	J	9.100	J	2.100	J	2.600		4.800		3.100	
BARIUM	MG/KG	102.000	J	1070.000	J	80.200		55.600		43.300	B	61.800	
BERYLLIUM	MG/KG	0.410	B	0.420	B	0.300	B	0.120	B	0.830	B	0.150	B
CADMIUM	MG/KG	0.270	U	0.270	U	0.210	U	0.350	U	0.380	U	0.330	U
CALCIUM	MG/KG	14500.000		9270.000		7840.000		9730.000	J	10700.000	J	8240.000	J
CHROMIUM	MG/KG	9.100		11.600		1.200	U	7.100		12.500		8.700	
COBALT	MG/KG	13.200		14.600		9.500	B	5.200	B	15.700		7.100	B
COPPER	MG/KG	18.000		18.200		13.600		8.800	U	15.100	U	9.400	U
IRON	MG/KG	23500.000		26500.000		13400.000		11900.000		23100.000		13700.000	
LEAD	MG/KG	7.400		4.900		3.000		3.300		5.100		2.400	
MAGNESIUM	MG/KG	6610.000		5940.000		4240.000		4050.000		5270.000		3600.000	
MANGANESE	MG/KG	421.000		421.000		365.000	J	223.000	J	234.000	J	267.000	J
MERCURY	MG/KG	0.050	U	0.050	U	0.120		0.050	UJ	2.100	J	0.050	U
NICKEL	MG/KG	10.000		11.100		20.700		8.100	B	17.600		7.600	B
POTASSIUM	MG/KG	1360.000		1370.000		1630.000		994.000	J	1400.000	J	862.000	J
SELENIUM	MG/KG	0.580	U	0.580	U	1.600	J	0.570	U	0.630	U	0.550	U
SILVER	MG/KG	1.500	B	1.800	B	7.600	J	0.850	U	1.500	U	1.100	U
SODIUM	MG/KG	328.000	U	334.000	U	552.000	BJ	1070.000		172.000	B	150.000	B
THALLIUM	MG/KG	1.600	U	1.800	U	0.260	U	0.760	U	0.840	B	0.730	U
VANADIUM	MG/KG	58.300		69.800		21.200		24.600		53.700		37.100	
ZINC	MG/KG	49.300	J	50.300	J	54.000	J	25.400		56.700		28.700	
CYANIDE	MG/KG	0.520	U	0.500	U	0.540	U	0.480	U	0.560	U	0.480	U
TITANIUM	MG/KG	1880.000		2100.000		---		776.000		1500.000		1150.000	

Verified
4/13/94

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DR0		B09DR1		B09DR3		B09DR4		B09DR5		B09DR6	
	Date	12-14-93		12-15-93		12-14-93		12-16-93		12-16-93		12-20-93	
	Location	U-8 CRIB		U-1 CRIB		U-8 CRIB		U-1 CRIB		U-8 CRIB		U-1 CRIB	
	Depth	57.50 - 59.50		60.00 - 62.00		68.00 - 70.00		80.00 - 82.00		89.50 - 91.50		99.50 - 101.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	6930.000		4860.000		5120.000		4960.000		7040.000		7660.000	
ANTIMONY	MG/KG	2.500	U	2.500	U	2.500	U	3.100	UJ	2.500	UJ	2.500	UJ
ARSENIC	MG/KG	5.600		2.100		4.100		2.400		4.800		5.400	
BARIUM	MG/KG	52.900		49.800		37.100	B	61.000		56.800		64.200	
BERYLLIUM	MG/KG	0.260	B	0.140	B	0.150	B	0.330	U	0.350	U	0.380	U
CADMIUM	MG/KG	0.350	U	0.340	U	0.340	U	0.350	U	0.350	U	0.350	U
CALCIUM	MG/KG	12500.000	J	9260.000	J	9110.000	J	10800.000		10400.000		9110.000	
CHROMIUM	MG/KG	10.100		7.300		8.800		7.900		12.000		13.600	
COBALT	MG/KG	6.700	B	5.600	B	5.300	B	8.200	B	7.100	B	7.700	B
COPPER	MG/KG	11.600	U	8.700	U	8.700	U	13.400	U	10.800	U	12.100	U
IRON	MG/KG	13300.000		12400.000		11700.000		16600.000		14300.000		14600.000	
LEAD	MG/KG	6.700		2.600		3.600		2.500		4.600		5.500	
MAGNESIUM	MG/KG	5410.000		4240.000		4220.000		4950.000		5030.000		5490.000	
MANGANESE	MG/KG	239.000	J	210.000	J	251.000	J	221.000		251.000		297.000	
MERCURY	MG/KG	0.350		0.050	U	0.050	U	0.050	U	0.160		0.050	U
NICKEL	MG/KG	8.900		7.800	B	8.700		9.500	U	10.900		13.000	
POTASSIUM	MG/KG	1610.000	J	908.000	J	918.000	J	785.000	B	1360.000		1730.000	
SELENIUM	MG/KG	0.580	U	0.570	U	0.570	U	0.580	U	0.570	U	0.580	U
SILVER	MG/KG	0.740	U	0.630	U	1.000	U	0.760	U	0.600	U	0.500	U
SODIUM	MG/KG	89.700	B	939.000	B	102.000	B	501.000	B	106.000	B	413.000	B
THALLIUM	MG/KG	0.770	U	0.950	B	0.750	U	0.760	U	1.200	B	0.880	B
VANADIUM	MG/KG	24.700		28.300		21.900		33.800		27.900		29.700	
ZINC	MG/KG	36.700		25.900		26.700		39.300		34.700		37.700	
CYANIDE	MG/KG	0.520	U	0.470	U	0.490	U	0.520	UJ	0.490	UJ	0.490	UJ
TITANIUM	MG/KG	664.000		859.000		608.000		1140.000		748.000		758.000	

Verified

4/13/94

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9213517.1491

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809DQ0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-019SAS No.: SDG No.: 809DQ0

Matrix (soil/water): SOIL Lab Sample ID: 12088-01S

Level (low/med): LOW Date Received: 12/09/93

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	7400			P	
7440-36-0	Antimony	2.7	~~U~~	N	P	UJ
7440-38-2	Arsenic	8.8		*	P	
7440-39-3	Barium	102		N*	P	UJ
7440-41-7	Beryllium	0.41	B		P	
7440-43-9	Cadmium	0.27	U		P	
7440-70-2	Calcium	14500			P	
7440-47-3	Chromium	9.1		*	P	
7440-48-4	Cobalt	13.2			P	
7440-50-8	Copper	18.0			P	
7439-89-6	Iron	23500			P	
7439-92-1	Lead	7.4			P	
7439-95-4	Magnesium	6610			P	
7439-96-5	Manganese	421			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	10.0			P	
7440-09-7	Potassium	1360			P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	1.5	B		P	
7440-23-5	Sodium	328	~~B~~		P	UJ
7440-28-0	Thallium	1.6	~~B~~		P	UJ
7440-62-2	Vanadium	58.3			P	
7440-66-6	Zinc	49.3		E	P	UJ
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	1880			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified
3/31/94

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FORM I - IN 012 ILM02.1

9213517.1492

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809DQ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-0195AS No.: SDG No.: 809DQ0

Matrix (soil/water): SOIL Lab Sample ID: 12088-02S

Level (low/med): LOW Date Received: 12/09/93

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	7560			P	
7440-36-0	Antimony	2.7		N	P	UJ
7440-38-2	Arsenic	9.1		*	P	
7440-39-3	Barium	1070		N*	P	UJ
7440-41-7	Beryllium	0.42	B		P	
7440-43-9	Cadmium	0.27	U		P	
7440-70-2	Calcium	9270			P	
7440-47-3	Chromium	11.6		*	P	
7440-48-4	Cobalt	14.6			P	
7440-50-8	Copper	18.2			P	
7439-89-6	Iron	26500			P	
7439-92-1	Lead	4.9			P	
7439-95-4	Magnesium	5940			P	
7439-96-5	Manganese	421			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	11.1			P	
7440-09-7	Potassium	1370			P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	1.8	B		P	
7440-23-5	Sodium	334	~~B~~		P	UJ
7440-28-0	Thallium	1.8	~~B~~		P	UJ
7440-62-2	Vanadium	69.8			P	
7440-66-6	Zinc	50.3		E	P	UJ
	Cyanide	0.50	U		CA	
7440-32-6	Titanium	2100			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified
3/31/94

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FORM I - IN ILM02.1

9213512.1493

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809DQ6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-038SAS No.: SDG No.: 809DQ6

Matrix (soil/water): SOIL Lab Sample ID: 12147-01S

Level (low/med): LOW Date Received: 12/16/93

% Solids: 91.7

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	7570			P	
7440-36-0	Antimony	2.8	~~U~~	N	P	UJ
7440-38-2	Arsenic	2.1		SN	F	J
7440-39-3	Barium	80.2			P	
7440-41-7	Beryllium	0.30	B		P	
7440-43-9	Cadmium	0.21	U		P	
7440-70-2	Calcium	7840			P	
7440-47-3	Chromium	1.2	U		P	
7440-48-4	Cobalt	9.5	B		P	
7440-50-8	Copper	13.6			P	
7439-89-6	Iron	13400			P	
7439-92-1	Lead	3.0			F	
7439-95-4	Magnesium	4240			P	
7439-96-5	Manganese	365		N	P	J
7439-97-6	Mercury	0.12			CV	
7440-02-0	Nickel	20.7			P	
7440-09-7	Potassium	1630			P	
7782-49-2	Selenium	1.6		SN*	F	J
7440-22-4	Silver	7.6		N*	P	J
7440-23-5	Sodium	552	~~B~~	E	P	BJ
7440-28-0	Thallium	0.26	U		F	
7440-62-2	Vanadium	21.2			P	
7440-66-6	Zinc	54.0		E	P	J
	Cyanide	0.54	U		CA	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

Titanium analysis was requested, however it is not reported and is not included in the raw data.

Verified 4/01/94

-014

FORM I - IN ILM02.1

AA2

9713517.1494

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DQ7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-04S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 97.4

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	4800			P	
7440-36-0	Antimony	2.5	U		P	
7440-38-2	Arsenic	2.6			P	
7440-39-3	Barium	55.6			P	
7440-41-7	Beryllium	0.12	B		P	
7440-43-9	Cadmium	0.35	U		P	
7440-70-2	Calcium	9730		E	P	~~u~~ J 4/12/94
7440-47-3	Chromium	7.1			P	
7440-48-4	Cobalt	5.2	B		P	
7440-50-8	Copper	8.8			P	u
7439-89-6	Iron	11900			P	
7439-92-1	Lead	3.3			P	
7439-95-4	Magnesium	4050			P	
7439-96-5	Manganese	223		N	P	J
7439-97-6	Mercury	0.05	~~U~~		CV	UJ
7440-02-0	Nickel	8.1	B		P	
7440-09-7	Potassium	994	~~B~~	E	P	~~UJ~~ 4/12/94
7782-49-2	Selenium	0.57	U		P	
7440-22-4	Silver	0.85	~~B~~		P	u
7440-23-5	Sodium	1070			P	
7440-28-0	Thallium	0.76	U		P	
7440-62-2	Vanadium	24.6			P	
7440-66-6	Zinc	25.4			P	
	Cyanide	0.48	U		CA	
7440-32-6	Titanium	776			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

015

Comments:
STONES

Verified 3/29/94

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9713512.1495

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DQ8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-05S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 88.5

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	10700			P	
7440-36-0	Antimony	2.7	U		P	
7440-38-2	Arsenic	4.8			P	
7440-39-3	Barium	43.3	B		P	
7440-41-7	Beryllium	0.83	B		P	
7440-43-9	Cadmium	0.38	U		P	
7440-70-2	Calcium	10700		E	P	~~u~~ J
7440-47-3	Chromium	12.5			P	
7440-48-4	Cobalt	15.7			P	
7440-50-8	Copper	15.1			P	u
7439-89-6	Iron	23100			P	
7439-92-1	Lead	5.1			P	
7439-95-4	Magnesium	5270			P	
7439-96-5	Manganese	234		N	P	J
7439-97-6	Mercury	2.1			CV	J
7440-02-0	Nickel	17.6			P	
7440-09-7	Potassium	1400		E	P	~~u~~ J
7782-49-2	Selenium	0.63	U		P	
7440-22-4	Silver	1.5	~~B~~		P	u
7440-23-5	Sodium	172	B		P	
7440-28-0	Thallium	0.84	B		P	
7440-62-2	Vanadium	53.7			P	
7440-66-6	Zinc	56.7			P	
	Cyanide	0.56	U		CA	
7440-32-6	Titanium	1500			P	

4/12/94

4/12/94

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

Verified 3/29/94

016

FORM I - IN ILM02.1

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9213517.1496

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DQ9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-06S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 97.7

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	5430			P	
7440-36-0	Antimony	2.4	U		P	
7440-38-2	Arsenic	3.1			P	
7440-39-3	Barium	61.8			P	
7440-41-7	Beryllium	0.15	B		P	
7440-43-9	Cadmium	0.33	U		P	
7440-70-2	Calcium	8240		E	P	~~u~~ J
7440-47-3	Chromium	8.7			P	
7440-48-4	Cobalt	7.1	B		P	
7440-50-8	Copper	9.4			P	u
7439-89-6	Iron	13700			P	
7439-92-1	Lead	2.4			P	
7439-95-4	Magnesium	3600			P	
7439-96-5	Manganese	267		N	P	J
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	7.6	B		P	
7440-09-7	Potassium	862	~~B~~	E	P	~~u~~ BJ
7782-49-2	Selenium	0.55	U		P	
7440-22-4	Silver	1.1	~~B~~		P	u
7440-23-5	Sodium	150	B		P	
7440-28-0	Thallium	0.73	U		P	
7440-62-2	Vanadium	37.1			P	
7440-66-6	Zinc	28.7			P	
	Cyanide	0.48	U		CA	
7440-32-6	Titanium	1150			P	

4/12/94

4/12/94

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified 3/29/94

-017

FORM I - IN ILM02.1

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9713517.1497

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DR0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-01S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	6930			P	
7440-36-0	Antimony	2.5	U		P	
7440-38-2	Arsenic	5.6			P	
7440-39-3	Barium	52.9			P	
7440-41-7	Beryllium	0.26	B		P	
7440-43-9	Cadmium	0.35	U		P	
7440-70-2	Calcium	12500		E	P	~~U~~ J
7440-47-3	Chromium	10.1			P	
7440-48-4	Cobalt	6.7	B		P	
7440-50-8	Copper	11.6			P	U
7439-89-6	Iron	13300			P	
7439-92-1	Lead	6.7			P	
7439-95-4	Magnesium	5410			P	
7439-96-5	Manganese	239		N	P	J
7439-97-6	Mercury	0.35			CV	
7440-02-0	Nickel	8.9			P	
7440-09-7	Potassium	1610		E	P	~~U~~ J
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	0.74	~~B~~		P	U
7440-23-5	Sodium	89.7	B		P	
7440-28-0	Thallium	0.77	U		P	
7440-62-2	Vanadium	24.7			P	
7440-66-6	Zinc	36.7			P	
	Cyanide	0.52	U		CA	
7440-32-6	Titanium	664			P	

4/12/94

4/12/94

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts:

Comments:

verified 3/29/94

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FORM I - IN ILM02.1

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9213517.1498

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DR1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-02S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 96.8

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	4860			P	
7440-36-0	Antimony	2.5	U		P	
7440-38-2	Arsenic	2.1			P	
7440-39-3	Barium	49.8			P	
7440-41-7	Beryllium	0.14	B		P	
7440-43-9	Cadmium	0.34	U		P	
7440-70-2	Calcium	9260		E	P	~~u~~ J 4/12/94
7440-47-3	Chromium	7.3			P	
7440-48-4	Cobalt	5.6	B		P	
7440-50-8	Copper	8.7			P	u
7439-89-6	Iron	12400			P	
7439-92-1	Lead	2.6			P	
7439-95-4	Magnesium	4240			P	
7439-96-5	Manganese	210		N	P	J
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	7.8	B		P	
7440-09-7	Potassium	908	~~B~~	E	P	~~u~~ J 4/12/94
7782-49-2	Selenium	0.57	U		P	
7440-22-4	Silver	0.63	~~B~~		P	u
7440-23-5	Sodium	939	B		P	
7440-28-0	Thallium	0.95	B		P	
7440-62-2	Vanadium	28.3			P	
7440-66-6	Zinc	25.9			P	
	Cyanide	0.47	U		CA	
7440-32-6	Titanium	859			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified 3/29/94

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9713517.1499

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DR3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Lab Sample ID: 12192-03S

Level (low/med): LOW Date Received: 12/21/93

% Solids: 97.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	5120			P	
7440-36-0	Antimony	2.5	U		P	
7440-38-2	Arsenic	4.1			P	
7440-39-3	Barium	37.1	B		P	
7440-41-7	Beryllium	0.15	B		P	
7440-43-9	Cadmium	0.34	U		P	
7440-70-2	Calcium	9110		E	P	~~u~~ J
7440-47-3	Chromium	8.8			P	
7440-48-4	Cobalt	5.3	B		P	
7440-50-8	Copper	8.7			P	u
7439-89-6	Iron	11700			P	
7439-92-1	Lead	3.6			P	
7439-95-4	Magnesium	4220			P	
7439-96-5	Manganese	251		N	P	J
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	8.7			P	
7440-09-7	Potassium	918	~~B~~	E	P	~~u~~ BJ
7782-49-2	Selenium	0.57	U		P	
7440-22-4	Silver	1.0	~~B~~		P	u
7440-23-5	Sodium	102	B		P	
7440-28-0	Thallium	0.75	U		P	
7440-62-2	Vanadium	21.9			P	
7440-66-6	Zinc	26.7			P	
	Cyanide	0.49	U		CA	
7440-32-6	Titanium	608			P	

4/12/94

4/12/94

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified 3/29/94

020

FORM I - IN ILM02.1

7

9213512.1500

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DR4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Lab Sample ID: 12226-01S

Level (low/med): LOW Date Received: 12/23/93

% Solids: 96.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	4960			P	
7440-36-0	Antimony	3.1	~~B~~	N	P	~~BS~~ UJ
7440-38-2	Arsenic	2.4			P	
7440-39-3	Barium	61.0			P	
7440-41-7	Beryllium	0.33	~~B~~		P	U
7440-43-9	Cadmium	0.35	U		P	
7440-70-2	Calcium	10800			P	
7440-47-3	Chromium	7.9			P	
7440-48-4	Cobalt	8.2	B		P	
7440-50-8	Copper	13.4	—		P	U
7439-89-6	Iron	16600			P	
7439-92-1	Lead	2.5			P	
7439-95-4	Magnesium	4950			P	
7439-96-5	Manganese	221			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	9.5	—		P	U
7440-09-7	Potassium	785	B		P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	0.76	~~B~~		P	U
7440-23-5	Sodium	501	B		P	
7440-28-0	Thallium	0.76	U		P	
7440-62-2	Vanadium	33.8			P	
7440-66-6	Zinc	39.3			P	
	Cyanide	0.52	~~U~~		CA	UJ
7440-32-6	Titanium	1140			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified [illegible] 3/28/94

~~AM2~~

021

9713517.1501

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DR5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Lab Sample ID: 12226-02S

Level (low/med): LOW Date Received: 12/23/93

% Solids: 96.7

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum +	7040.			P	
7440-36-0	Antimony +	2.5	~~U~~	N	P	UJ
7440-38-2	Arsenic +	4.8			P	
7440-39-3	Barium +	56.8			P	
7440-41-7	Beryllium +	0.35	~~B~~		P	U
7440-43-9	Cadmium +	0.35	U		P	
7440-70-2	Calcium +	10400.			P	
7440-47-3	Chromium +	12.0			P	
7440-48-4	Cobalt +	7.1	B		P	
7440-50-8	Copper +	10.8	—		P	U
7439-89-6	Iron +	14300.			P	
7439-92-1	Lead +	4.6			P	
7439-95-4	Magnesium +	5030.			P	
7439-96-5	Manganese +	251.			P	
7439-97-6	Mercury +	0.16			CV	
7440-02-0	Nickel +	10.9			P	
7440-09-7	Potassium +	1360.			P	
7782-49-2	Selenium +	0.57	U		P	
7440-22-4	Silver +	0.60	~~B~~		P	U
7440-23-5	Sodium +	106.	B		P	
7440-28-0	Thallium +	1.2	B		P	
7440-62-2	Vanadium +	27.9			P	
7440-66-6	Zinc +	34.7			P	
	Cyanide +	0.49	~~U~~		CA	UJ
7440-32-6	Titanium +	748.			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified
3/28/94

022

~~003~~

9713517.1502

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B09DR6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Lab Sample ID: 12226-03S

Level (low/med): LOW Date Received: 12/23/93

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	7660			P	
7440-36-0	Antimony	2.5	~~U~~	N	P	US
7440-38-2	Arsenic	5.4			P	
7440-39-3	Barium	64.2			P	
7440-41-7	Beryllium	0.38	~~B~~		P	U
7440-43-9	Cadmium	0.35	U		P	
7440-70-2	Calcium	9110			P	
7440-47-3	Chromium	13.6			P	
7440-48-4	Cobalt	7.7	~~B~~		P	~~U~~B
7440-50-8	Copper	12.1	—		P	U
7439-89-6	Iron	14600			P	
7439-92-1	Lead	5.5			P	
7439-95-4	Magnesium	5490			P	
7439-96-5	Manganese	297			P	
7439-97-6	Mercury	0.05	U		CV	
7440-02-0	Nickel	13.0			P	
7440-09-7	Potassium	1730			P	
7782-49-2	Selenium	0.58	U		P	
7440-22-4	Silver	0.50	~~B~~		P	U
7440-23-5	Sodium	413	B		P	
7440-28-0	Thallium	0.88	B		P	
7440-62-2	Vanadium	29.7			P	
7440-66-6	Zinc	37.7			P	
	Cyanide	0.49	~~U~~		CA	US
7440-32-6	Titanium	758			P	

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

Verified
3/28/94

023

~~004~~

FORM I - IN ILM02.1

9713517.1503

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9713517.1504

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

B-9DQ0
B-9DQ1

RECORD COPY

JAN 1994
RECEIVED
SDLA

January 19, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Two (2) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 9, 1993 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S312088.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The digestion spike recoveries for antimony and barium exceeded control limit requirements.

The laboratory duplicate exceeded control limit requirements for arsenic, barium, and chromium.

The ICP serial dilution exceeded the control limit requirement for zinc.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

9213512.1505

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

B09D26

RECORD COPY

FEB 1994
RECEIVED
SDLA

January 26, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) soil sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1993 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S312147.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The matrix spike recoveries for antimony, arsenic, manganese, selenium and silver exceeded the control limit requirements.

The laboratory duplicate for selenium and silver exceeded the control limit requirements.

The ICP serial dilution for sodium and zinc exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

97:3517.1506

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

FEB 1994
RECEIVED
SDLA

RECORD COPY

B09Q27
B09Q28
B09Q29
B09R0
B09R1
B09R3

January 24, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Six (6) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 21, 1993 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S312192.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The digestion spike recoveries for manganese exceeded control limit requirements.

The ICP serial dilution exceeded the control limit requirements for calcium and potassium.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

9713517.1507

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

FEB 1994
RECEIVED
SDLA

RECORD COPY

January 25, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

B09DR4
B09DR5
B09DR6

Quality Control Narrative

Scope
Three (3) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 23, 1993 from TMA/Norcal. The samples were analyzed for the USEPA CLP Target Analyte List metals, titanium, and cyanide. The analyses were performed under TMA/Skinner and Sherman work order S312226.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The digestion spike recovery for antimony exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

9213517.1508

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-03-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 99733229 1

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-03-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Karen E. Rogers 12-07-93	J.D. Fowler J.D. Fowler	12/7/93 1309
Relinquished by:	Received by:	Date/Time:
12/7/93 J.D. Fowler J.D. Fowler 1335	H. NARCISO	12-08-93 1:00 P.M
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1509

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-06-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 9973322971 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-06-93

~~3)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 John Rogers 12-7-93	J.D. Fankhr J.D. Fankhr	12/7/93 1305
Relinquished by: J.D. Fankhr J.D. Fankhr 12/7/93 1335	Received by: [illegible] 225 / H. NARCISO	Date/Time: 12-08-93 1:00 P.M
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713512.1510

~~C000024~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-09-93

Ice Chest No.: SML-437

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~2)~~

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

12-09-93

3)

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Lorene E. Rogers 0950	[signature]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713512.1511

~~000002G~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9243517.1512

~~0000027~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ8

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0945 Doreen Rogers 12-17-93	Kermit Blum K. Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1513

~~000002~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No.: — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ9

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR0

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml ~~P:CLP;TAL~~ Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, ~~EP-71, EP-5~~) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Lorene E. Page 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213512.1514

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-15-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.: W940-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- ~~1,250ml aG:Semi-VOA CLP~~
- ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- ~~1,125ml G:Cyanide CLP~~
- ~~1,125ml Gw:Kerosene (8015M)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3) ~~B09~~

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 Loren E. Rogers 1200	W. V. Selby	12-17-93 1200
Relinquished by: W. V. Selby	Received by: Ramirez	Date/Time: 12-20-93 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Rec'd SATURDAY BUT opened 12-20-93 12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

L035

9213517.1515

~~000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-14-93

Ice Chest No.: — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DR3

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1516

~~000002A~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML 315 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8217 — Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) 309DR4

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 Homer Rogers 0845	W.V. Selyer	12.21.93 0846
Relinquished by: W.V. Selyer	Received by: Ramirez	Date/Time: 12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713517.1517

~~C000002C~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML-410 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1)

B09DR5

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/16/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Loren E. Rogers 12-21-93	Jeanise	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213517.1518

~~000002E~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-20-93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217

Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
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1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
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1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-20-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845	W.V. Selzer	12-21-93 0846
W.V. Selzer	[illegible]	12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

039

9713517.1519

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: B90Q6-TMA-681		
VALIDATOR: [illegible]		LAB: TMA		DATE: 03/31/94	
CASE:			SDG: B90Q6-TMA-681		

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	☒ Titanium-ICP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils

B90Q1

B90Q0

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: The analysis date for mercury on the raw data changes from 12/24/93 to 12/28/93. The log sheets say the calibration and analysis were performed on 12/28/93 and the ~~time~~ time of injection is consistent. Therefore, 12/28/93 was used for the analysis date. No qualification was req'd for the difference in the date since it appears that the date on ~~comp~~ instrument was updated in the middle of the run.

041

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: Sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
3/31/94 Comments: ~~MS %R for antimony and barium are less than~~
MS %R for antimony is 62%, <75% CL. Qualify results as estimated (J/UJ/RJ).
MS %R for barium is -132.8%, <30% CL. Qualify nondetects as unusable (UR) and detects as ~~usable~~ estimated (J).

042

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but ~~have been~~ will be evaluated in the final summary report.
4/13/94 See duplicate and ICP serial dilution forms, attached, for precision deficiencies.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09Q26-TMA-681

SDG:	VALIDATOR:	DATE: 4/01/94	PAGE 1 OF

COMMENTS: Metals

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DQ0	ICP-CLP	12/03/93		01/10/94		38	None
	As, Pb, Se, Tl			01/06/94		34	
	CN			12/16/93		13	
	Hg			12/28/93	04/01/94	25	
B09DQ1	ICP-CLP	12/06/93		01/10/94		35	
	As, Pb, Se, Tl			01/06/94		31	
	CN			12/16/93		10	
	Hg			12/28/93	04/01/94	22	

BLANK AND SAMPLE DATA SUMMARY

B09DQ6-TMA-681

SDG:	VALIDATOR:	DATE: 04/01/94	PAGE 1 OF 1
COMMENTS: Metals			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
Prep Blank	Sodium	96.196	B		mg/kg	480.98		B09DQ1	U
								B09DQ0	U
ICB	Thallium	2.2	B		ug/L	11		B09DQ1	U
								B09DQ0	U

9213517.1525

WESTINGHOUSE/HANFORD

SA

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER:

809DQ1S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-019SAS No.: SDG No.: 809DQ0

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 94.4

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	63.7671		2.6795	U	102.85	62.0	N	P
Arsenic	75-125	408.8160		9.1330		411.39	97.2		P
Barium	75-125	524.2513		1070.7669		411.39	-132.8	N	P
Beryllium	75-125	10.1016		0.4237	B	10.28	94.1		P
Cadmium	75-125	9.6943		0.2700	U	10.28	94.3		P
Calcium									NR
Chromium	75-125	47.4576		11.5674		41.14	87.2		P
Cobalt	75-125	111.8068		14.5729		102.85	94.5		P
Copper	75-125	66.8525		18.2494		51.42	94.5		P
Iron									NR
Lead	75-125	102.8447		4.8957		102.85	95.2		P
Magnesium									NR
Manganese		499.7532		420.6962		102.85	76.9		P
Mercury	75-125	0.5193		0.0530	U	0.53	98.0		CV
Nickel	75-125	105.7327		11.1146		102.85	92.0		P
Potassium									NR
Selenium	75-125	402.9538		0.5816	U	411.39	97.9		P
Silver	75-125	11.5024		1.7988	B	10.28	94.4		P
Sodium									NR
Thallium	75-125	398.6753		1.8338	B	411.39	96.5		P
Vanadium	75-125	161.0601		69.8342		102.85	88.7		P
Zinc	75-125	146.3880		50.3406		102.85	93.4		P
Cyanide	75-125	26.5316		0.5044	U	26.48	100.2		CA
Titanium		2119.6725		2097.0422		102.85	22.0		P

Comments:

Qualify Sb results as estimated (UJ).

Qualify Barium results as estimated (J) since the results are > IDL.

~~018~~

3/31/94

FORM V (Part 1) - IN ILM02.1

046

9413512.1526

WESTINGHOUSE/HANFORD

6

DUPLICATES

SAMPLE NUMBER: B09DQ1D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-019SAS No.: SDG No.: B09DQ0

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 94.4 % Solids for Duplicate: 94.6

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		7564.3902		6992.5539		7.9		P
Antimony		2.6795	U	2.6534	U			P
Arsenic	2.1	9.1330		4.9206		59.9	*	P
Barium	41.5	1070.7669		86.0067		170.3	*	P
Beryllium		0.4237	B	0.3476	B	19.7		P
Cadmium		0.2700	U	0.2674	U			P
Calcium		9271.7680		8338.4071		10.6		P
Chromium	2.1	11.5674		9.1801		23.0	*	P
Cobalt	10.4	14.5729		12.4157		16.0		P
Copper	5.2	18.2494		14.8943		20.2		P
Iron		26487.2051		23268.0599		12.9		P
Lead		4.8957		4.4779		8.9		P
Magnesium		5942.5889		5286.3255		11.7		P
Manganese		420.6962		364.8799		14.2		P
Mercury		0.0530	U	0.0504	U			CV
Nickel	8.3	11.1146		9.2336		18.5		P
Potassium	1038.6	1365.1753		1247.3054		9.0		P
Selenium		0.5816	U	0.5759	U			P
Silver		1.7988	B	1.5262	B	16.4		P
Sodium		333.9772	B	341.0400	B	2.1		P
Thallium		1.8338	B	1.6207	B	12.3		P
Vanadium		69.8342		60.7002		14.0		P
Zinc		50.3406		46.3510		8.3		P
Cyanide		0.5044	U	0.5193	U			CA
Titanium		2097.0422		1937.6748		7.9		P

Qualify As & Ba results as estimated (J).

3/31/94

047

~~020~~

FORM VI - IN TLM02.1

9713517.1527

WESTINGHOUSE/HANFORD

9

SAMPLE NUMBER:

ICP SERIAL DILUTIONS

B09DQ1L

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-019SAS No.: SDG No.: B09DQ0

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	36418.00		36295.00		0.3		P
Antimony	12.90	U	64.50	U			P
Arsenic	43.97		60.40		37.4		P
Barium	5155.10		5124.00		0.6		P
Beryllium	2.04	B	1.00	U	100.0		P
Cadmium	1.30	U	6.50	U			P
Calcium	44638.00		46459.50		4.1		P
Chromium	55.69		49.85	B	10.5		P
Cobalt	70.16		69.50	B	0.9		P
Copper	87.86		86.30	B	1.8		P
Iron	127520.00		128565.00		0.8		P
Lead	23.57		25.30		7.3		P
Magnesium	28610.00		28461.50		0.5		P
Manganese	2025.40		2021.90		0.2		P
Mercury							NR
Nickel	53.51		56.55	B	5.7		P
Potassium	6572.50		6363.50	B	3.2		P
Selenium	2.80	U	23.75	B			P
Silver	8.66	B	13.00	U	100.0		P
Sodium	1607.90	B	1560.90	B	2.9		P
Thallium	8.83	B	32.38	B	266.7		P
Vanadium	336.21		326.55		2.9		P
Zinc	242.36		284.05		17.2	E	P
Titanium	10096.00		9847.50		2.5		P

Qualifying zinc results for B09DQ0 and B09DQ1 as estimated (J).

4/13/94

048

~~023~~

FORM IX - IN

ILM02.1

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: B09D06-TMA-681		
VALIDATOR: [illegible]		LAB: TMA		DATE: 04/01/94	
CASE:			SDG: B09D06-TMA-681		
ANALYSES PERFORMED [illegible]/01/94					
☒ CLP/ICP	☒ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	~~☒ Titrimetric~~ ☐	
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX Soil					
B09D06					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

049

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A 4/1/94
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: Sample locations are not currently available but will be evaluated in the final summary report.
- Arsenic was detected in the prep blank at a negative concentration. The assoc. result has been qualified as estimated (J).

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments: See attached matrix spike form for deficiencies and required qualifications.

050

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

See comment on following page 5/4/94

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report. Serial dilution results for Na and Zn were unacceptable, all sample results qualified as estimated.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No ~~N/A~~
Are duplicate injection %RSD values acceptable? . . . . . Yes No ~~N/A~~
Were analytical spikes performed as required? . . . . . Yes No ~~N/A~~ 5/2/94
Are analytical spike recoveries acceptable? . . . . . Yes No ~~N/A~~
Was MSA performed as required? . . . . . Yes No ~~N/A~~
Are MSA results acceptable? . . . . . Yes No ~~N/A~~

Comments: GFAA analytical spike %R for As & Se were 58% and 60%, respectively. However, MSA was performed on both samples. Therefore, no qualification is required. 5/2/94

8. REPORTED RESULTS AND DETECTION LIMITS

4/5/94

Are results reported for all requested analyses? . . . . . ~~Yes~~ No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A

Comments: Titanium was requested on the COC to be analyzed along with the CLP TAL metals. However, it was not reported for this sample and the titanium result is not provided in the raw data. No qualification is required.

Revised 5/2/94

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

4/13/94

The lab narrative states that the duplicate sample results for Selenium and Silver were unacceptable. However, both sample results are ~~less than~~ <5xCRDL and the duplicate results are within 2xCRDL. Therefore, according to the DV procedures, the duplicate results are acceptable and no qualification is required.

4/13/94

HOLDING TIME SUMMARY

B09DQ6-TMA-681

SDG:	VALIDATOR:	DATE: 4/01/94	PAGE 1 OF 1
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DQ6	ICP-CLP	12/09/93		01/15/94		37	None
	~~As, Pb, Se, Tl~~						
B09DQ6	CN	12/09/93		~~01/22~~ 12/22/93	01/01/94	13	None
	Hg			01/04/94		26	
	As/Se-GFAA			01/25/94		47	
	Pb/Tl-GFAA			01/22/94		44	

4/01/94

BLANK AND SAMPLE DATA SUMMARY

B09Q6-TMA-681

SDG:	VALIDATOR:	DATE: 4/04/94	PAGE 1 OF 1
COMMENTS: Metals			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PBLK	Arsenic	-0.683	B		mg/kg		6.83	B09Q6	J

4/14/94

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SA

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER:

B09DQ6S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-038SAS No.: SDG No.: B09DQ6

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 91.7

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	63.3404		2.7777	U	107.97	58.7	N	P
Arsenic	75-125	8.1536		2.1199		8.47	71.2	N	F
Barium	75-125	491.0114		80.1712		431.89	95.1		P
Beryllium	75-125	10.7950		0.3025	B	10.80	97.2		P
Cadmium	75-125	10.5920		0.2058	U	10.80	98.1		P
Calcium									NR
Chromium	75-125	43.0310		1.1522	U	43.19	99.6		P
Cobalt	75-125	114.3829		9.4998	B	107.97	97.1		P
Copper	75-125	63.5801		13.6479		53.99	92.5		P
Iron									NR
Lead	75-125	7.7115		3.0378		4.24	110.2		F
Magnesium									NR
Manganese	75-125	546.8111		364.8279		107.97	168.5	N	P
Mercury	75-125	0.6926		0.1177		0.52	110.6		CV
Nickel	75-125	121.2088		20.7403		107.97	93.1		P
Potassium									NR
Selenium	75-125	1.4626		1.6103		2.12	-7.0	N	F
Silver	75-125	13.5116		7.5945		10.80	54.8	N	P
Sodium									NR
Thallium	75-125	9.7870		0.2650	U	10.59	92.4		F
Vanadium	75-125	135.4114		21.2156		107.97	105.8		P
Zinc	75-125	147.6403		54.0256		107.97	86.7		P
Cyanide	75-125	22.2149		0.5399	U	25.24	88.0		CA

Comments:

Qualify Sb result as estimated (UJ).

Qualify As, Mn, Se, & Ag as estimated (J).

4/01/94

L055

FORM V (Part 1) - IN ILM02.1

~~012~~

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WESTINGHOUSE/HANFORD

9

ICP SERIAL DILUTIONS

SAMPLE NUMBER:

809DQ6L

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-038SAS No.: SDG No.: 809DQ6

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	36801.00		35913.00		2.4		P
Antimony	13.50	U	67.50	U			P
Arsenic							NR
Barium	389.64		372.60	B	4.4		P
Beryllium	1.47	B	0.50	U	100.0		P
Cadmium	1.00	U	5.00	U			P
Calcium	38102.00		40487.00		6.3		P
Chromium	5.60	U	28.00	U			P
Cobalt	46.17	B	49.25	B	6.7		P
Copper	66.33		71.15	B	7.3		P
Iron	65076.00		66670.00		2.4		P
Lead							NR
Magnesium	20606.00		21311.50	B	3.4		P
Manganese	1773.10		1808.50		2.0		P
Mercury							NR
Nickel	100.80		117.65	B	16.7		P
Potassium	7928.90		7962.00	B	0.4		P
Selenium							NR
Silver	36.91		43.85	B	18.8		P
Sodium	2683.50	B	3088.55	B	15.1	E	P
Thallium							NR
Vanadium	103.11		107.55	B	4.3		P
Zinc	262.57		333.40		27.0	E	P

Qualifying Na & Zn results as estimated (BJ/J).

4/01/94

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FORM IX - IN

ILM02.1

017

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: B09DQ6-TMA-681		
VALIDATOR: [illegible]		LAB: TMA		DATE: 03/28/94	
CASE:			SDG: B09DQ6-TMA-681		

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	☒ Titanium JOP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX

B09DQ7 B09DR3
B09DQ8
B09DQ9
B09DR0
B09DR1

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes (No) N/A 4/4/94

Comments: Mercury HT was unacceptable for samples B09DQ7 and B09DQ8, results qualified as estimated.

057

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are ICP interference checks acceptable? . . . . . Yes No N/A

Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A

Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A

Are ICB and CCB results acceptable? . . . . . ~~Yes~~ No N/A 4/12/94

Were preparation blanks analyzed? . . . . . Yes No N/A

Are preparation blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . See note below . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Copper and silver in all samples were qualified as undetected (U) due to blank contamination.

- Sample locations are not currently available but will be evaluated in the final summary report

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A

Are spike sample recoveries acceptable? . . . . . Yes No N/A

Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: MS %R for manganese is 12.9%. All results have been qualified as estimated (J) since the results are > IDL.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: ICP serial dilution %D for Ca & K are unacceptable. Results have been qualified as estimated (J).

- Sample locations are not currently available. However, will be evaluated in the final summary report.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09D96-TMA-681

SDG:	VALIDATOR:	DATE: 3/29/94	PAGE 1 OF 2
COMMENTS: Metals Holding Times			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09D97	CLP ICP&T.	12/13/93		01/18/94		36	None
	Pb, Tl, Se, As			01/17/94		35	
	Hg			01/11/94		29	UJ
	CN			12/23/93		10	None
B09D98	CLP ICP&T.	12/13/93		01/18/94		36	
	As, Pb, Se, Tl			01/17/94		35	
	Hg			01/11/94		29	J
	CN			12/23/93		10	None
B09D99	CLP ICP&T.	12/14/93		01/18/94		35	
	As, Pb, Se, Tl			01/17/94		34	
	Hg			01/11/94		28	
	CN			12/23/93		9	
B09DR0	CLP ICP&T.	12/14/93		01/18/94		35	
	As, Pb, Se, Tl			01/17/94		34	
	Hg			01/11/94		28	
	CN			12/23/93		9	

HOLDING TIME SUMMARY

B09D96-TMA-681

SDG:	VALIDATOR:	DATE: 3/29/94	PAGE 2 OF 2
COMMENTS: Metals - Holding Times			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DR1	CLP ICP&TI	12/15/93		01/18/94		34	None
	As, Pb, Se, Tl			01/17/94		33	
	Hg			01/11/94		27	
	CN			12/23/93		8	
B09DR3	CLP ICP&TI	12/14/93		01/18/94		35	
	As, Pb, Se, Tl			01/17/94		34	
	Hg			01/11/94		28	
	CN			12/23/93		9	

BLANK AND SAMPLE DATA SUMMARY

SDG: B09DQ6-TMA-681 VALIDATOR: [illegible] DATE: 3/28/94 PAGE 1 OF 1

COMMENTS: Metals Blank Adjustment

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB4	Silver	2.42			ug/L	12.1		B09DR0	u
								B09DR1	u
								B09DR3	u
								B09DQ7	u
								B09DQ8	u
								B09DQ9	u
ICB	Copper	18.89			ug/L	94.5		B09DR0	u
								B09DR1	u
								B09DR3	u
								B09DQ7	u
								B09DQ8	u
								B09DQ9	u
CCB4	Copper	10.47			ug/L	52.4		B09DR1	u
								B09DR3	u
								B09DQ7	u
								B09DQ9	u

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WESTINGHOUSE/HANFORD

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER: B09DQ9S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 97.7

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	72.7390		2.4014	U	96.56	75.3		P
Arsenic	75-125	375.9487		3.1244		386.24	96.5		P
Barium	75-125	424.4993		61.7550		386.24	93.9		P
Beryllium	75-125	9.1752		0.1535	B	9.66	93.4		P
Cadmium	75-125	8.9338		0.3346	U	9.66	92.5		P
Calcium									NR
Chromium	75-125	42.9752		8.7040		38.62	88.7		P
Cobalt	75-125	96.8637		7.0644	B	96.56	93.0		P
Copper	75-125	57.3705		9.3595		48.28	99.4		P
Iron									NR
Lead	75-125	93.2910		2.3852		96.56	94.1		P
Magnesium									NR
Manganese	75-125	279.3882		266.9475		96.56	12.9	N	P
Mercury	75-125	0.5302		0.0512	U	0.49	108.2		CV
Nickel	75-125	111.0678		7.5506	B	96.56	107.2		P
Potassium									NR
Selenium	75-125	369.4985		0.5511	U	386.24	95.7		P
Silver	75-125	10.1002		1.1003	B	9.66	93.2		P
Sodium									NR
Thallium	75-125	362.1792		0.7283	U	386.24	93.8		P
Vanadium	75-125	117.0603		37.1172		96.56	82.8		P
Zinc	75-125	111.5564		28.7281		96.56	85.8		P
Cyanide	75-125	22.5093		0.4783	U	25.59	88.0		CA
Titanium		927.3092		1150.9920		96.56	-231.7		P

Comments:

Qualify all Mn results as estimated (J) since the sample results are > 5 Dl.

3/28/94

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WESTINGHOUSE/HANFORD

9

ICP SERIAL DILUTIONS

SAMPLE NUMBER: B09DQ9L

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-059SAS No.: SDG No.: B09DQ7

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M	
Aluminum	27597.00		27819.00		0.8		P	
Antimony	12.20	U	61.00	U			P	
Arsenic	15.87		19.78	B	24.6		P	
Barium	313.74		321.40	B	2.4		P	
Beryllium	0.78	B	1.50	U	100.0		P	
Cadmium	1.70	U	8.50	U			P	
Calcium	41854.00		46431.50		10.9	E	P	J
Chromium	44.22		58.30		31.8		P	
Cobalt	35.89	B	45.70	B	27.3		P	
Copper	47.55		180.60		279.8		P	
Iron	69359.00		70295.00		1.3		P	
Lead	12.12		9.62	B	20.6		P	
Magnesium	18298.00		18673.50	B	2.1		P	
Manganese	1356.20		1380.30		1.8		P	
Mercury							NR	
Nickel	38.36	B	106.20	B	176.9		P	
Potassium	4376.90	B	5891.50	B	34.6	E	P	J
Selenium	2.80	U	14.00	U			P	
Silver	5.59	B	13.60	B	143.3		P	
Sodium	760.97	B	2206.40	B	189.9		P	
Thallium	3.70	U	35.21	B			P	
Vanadium	188.57		195.00	B	3.4		P	
Zinc	145.95		418.35		186.6		P	
Titanium	5847.50		5830.00		0.3		P	

Qualifying Ca & K results as estimated (J).

3/28/94

FORM IX - IN ILM02.1 064 ~~21~~

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UR-2		DATA PACKAGE: B09Q6-TMA-681
VALIDATOR: [illegible]	LAB: TMA	DATE: 03/29/94
CASE:		SDG: B09Q6-TMA-681

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	☒ Titanium-CLP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soils

B09DR4
B09DR5
B09DR6

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: CN was analyzed out of holding time. Assoc. Results have been qualified as estimated (UJ).

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: See attached blank Sample Sec lab contaminants.
- The sample locations are not currently available but will be evaluated in the final summary report.

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments: MS%R Sec antimony is <75%. Qualify results as estimated (UJ).
9/14/94

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Sample locations are not currently available but will be evaluated in the final summary report

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

B09DQ6-TMA-681

SDG:	VALIDATOR: [illegible]	DATE 3/8/94	PAGE 1 OF 1
COMMENTS: Metals Holding Times			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DR4	ICP-CLP-TI.	12/16/93		01/20/94		35	None
	As, Pb Tl, Se			01/18/94		33	
	Hg			01/13/94		28	
	CN			01/04/94		19	UJ
B09DR5	ICP-CLP-TI.	12/16/93		01/20/94		35	None
	As, Pb Se, Tl			01/18/94		33	
	Hg			01/13/94		28	
	CN			01/04/94		19	UJ
B09DR6	ICP-CLP-TI.	12/20/93		01/20/94		31	None
	As, Pb Se, Tl			01/18/94		29	
	Hg			01/13/94		24	
	CN			01/04/94		15	UJ

BLANK AND SAMPLE DATA SUMMARY

B09D26-TMA-631

SDG:	VALIDATOR: [illegible]	DATE: 4/4/94	PAGE 1 OF 1
COMMENTS: Metals			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	Antimony	16.2	B		ug/L	81		B09DR4	U
CCB1	↓	21.2	B		ug/L	106		↓	↓
CCB1	Beryllium	1	B		ug/L	5		B09DR4, R5, R6	U
CCB2	↓	0.9	B		ug/L	4.5		↓	U
ICB	Copper	24	B		ug/L	120		B09DR4, R5, R6	U
CCB1		18.5	B		ug/L	92.5			
CCB2		12.9	B		ug/L	64.5			
PrepBlank	↓	1.174	B		mg/kg	5.87		↓	↓
CCB1	Nickel	10.4	B		ug/L	52		B09DR4, ~~R5~~, R6	U
CCB2	↓	7.3	B		ug/L	36.5		↓	U
ICB	Silver	5.8	B		ug/L	29		B09DR4, R5, R6	U

4/4/94

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WESTINGHOUSE/HANFORD

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER:

B09DR6S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-12-063SAS No.: SDG No.: B09DR4

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 93.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	56.0134		2.5472	U	101.44	55.2	N	P
Arsenic	75-125	388.8618		5.4285		405.76	94.5		P
Barium	75-125	449.4624		64.2384		405.76	94.9		P
Beryllium	75-125	9.6389		0.3821	B	10.14	91.3		P
Cadmium	75-125	8.8273		0.3549	U	10.14	87.1		P
Calcium									NR
Chromium	75-125	51.2944		13.6215		40.58	92.8		P
Cobalt	75-125	101.2984		7.7482	B	101.44	92.2		P
Copper	75-125	60.0588		12.0514		50.72	94.7		P
Iron									NR
Lead	75-125	96.6646		5.4542		101.44	89.9		P
Magnesium									NR
Manganese	75-125	389.6936		297.1083		101.44	91.3		P
Mercury	75-125	0.4789		0.0538	U	0.54	88.7		CV
Nickel	75-125	105.1856		12.9763		101.44	90.9		P
Potassium									NR
Selenium	75-125	372.2865		0.5846	U	405.76	91.8		P
Silver	75-125	10.0122		0.4990	B	10.14	93.8		P
Sodium									NR
Thallium	75-125	376.2426		0.8762	B	405.76	92.5		P
Vanadium	75-125	122.6801		29.6503		101.44	91.7		P
Zinc	75-125	129.7099		37.7367		101.44	90.7		P
Cyanide	75-125	24.9631		0.4932	U	26.10	95.6		CA
Titanium		880.0974		758.1585		101.44	120.2		P

Comments: Qualify Sb results as estimated (UJ)
3/29/94

070

~~015~~

3/29/94

9213517.1550

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

APR 1994 RECEIVED TQO

Golder Associates

April 25, 1994

Our ref: 923-E418
S/O/3029

Westinghouse Hanford Company
Hanford Analytical Services
P.O. Box 1970
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGES, 200-UP-2 DATA VALIDATION PROJECT, TASK ORDER S94-18, CONTRACT MJK-SVV-073750

Dear Ms. Duncan:

Enclosed is a radiochemistry data validation package for the 200-UP-2 project. The data package included in this shipment is as follows:

- B09DQ6-TMA-681

Two copies of the validation documentation are located in the front of the data package folder. Please call if you have questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen

Christina I. Jensen
Task Manager

Douglas G. Dunster

Douglas G. Dunster
Project Director

RECEIVED
APR 27 1994
VALIDATION DOCUMENTATION
SDLA

CJ\DGD\ah

cc: P.K. Brockman, SAIC
K. Angelos

9213517.1551

MEMORANDUM

APR 1994 RECEIVED TQO

TO: 200 UP-2 Project QA Record

April 22, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09DQ6-TMA-681 (923-E418 681RAD.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09DQ6-TMA-681 prepared by the TMA/Norcal laboratory under contract to Westinghouse/Hanford using WHC approved methods. Information concerning the samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DQ0	12/03/93	SOIL	SEE NOTE 1.
B09DQ1	12/06/93	SOIL	
B09DQ2	12/07/93	SOIL	
B09DQ6	12/09/93	SOIL	
B09DQ7	12/13/93	SOIL	
B09DQ8	12/13/93	SOIL	
B09DQ9	12/14/93	SOIL	
B09DR0	12/14/93	SOIL	
B09DR1	12/15/93	SOIL	
B09DR3	12/14/93	SOIL	
B09DR4	12/16/93	SOIL	
B09DR5	12/16/93	SOIL	
B09DR6	12/20/93	SOIL	

RECEIVED APR 27 1994 VALIDATION DOCUMENTATION SDLA

NOTES:

1. Indicates the samples were analyzed for gross alpha/beta, strontium-90, technetium-99 (beta counting), selenium-79 (liquid scintillation), isotopic plutonium, uranium, curium-244, americium-241, and neptunium-237 (alpha spectroscopy), total uranium (laser fluorometry), and selected radioisotopes by gamma spectroscopy.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data with the exception of recalculated minimum detectable activities (MDA) as indicated under "Minor Deficiencies" below. Updated Np-237 results for B09DQ1 were recieved by validators on April 20, 1994 and validated according to WHC procedures. Attachments 3 and 5 provide the revised result and supporting documentation.

Detection Limits. Detection limit goals were met with the exception that several minimum detectable activities (MDA) exceeded the required detection limits (RDL) due to low chemical yield, insufficient sample size, and high uranium activity (necessitating a lower than normal aliquot taken for analysis). Attachments 4 and 5 provide additional supporting documentation.

Completeness. The data package was complete for all requested analyses. A total of thirteen (13) samples were validated in this data package with a total of 455 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the work plan objective of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Chemical Recoveries

- Chemical carrier recoveries for selenium-79, and technetium-99, were below required limits for selected samples, therefore the associated results for these samples have been qualified as estimated (J/UJ). Attachments 2 and 5 provide summaries of the samples affected, data qualification applied, and supporting documentation.

Tracer Recoveries

- The americium tracer recovery for neptunium-237 analysis was below the required limit for sample B09DR1, therefore the affected result has been qualified as estimated (J). Attachments 2 and 5 provide a summary of the data qualification applied, and supporting documentation.

Sample Result Verification

- Uranium-235 MDAs could not be verified by recalculation for samples B09DQ6 and B09DQ8, therefore associated results reported by the laboratory have been qualified as estimated (J/UJ). Attachments 2 and 5 provide a summary of the data qualification applied, and supporting documentation.

DATA REPORTING

- For laboratory results reported below the MDA, the results have been crossed out on the report forms for clarification purposes, and the MDA values are reported in the validated data summary with a "U" qualifier.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

9713517.1554

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-001, REV.1

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B09DQ6-TMA-681	REVIEWER: T. STAPP	DATE: 4-22-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
SELENIUM-79	UJ	B09DQ8	CHEMICAL CARRIER RECOVERY BELOW 30% BUT GREATER THAN 10% LIMIT
TECHNETIUM-99	UJ	B09DQ1 B09DQ2	CHEMICAL CARRIER RECOVERY BELOW 30% BUT GREATER THAN 10% LIMIT
NEPTUNIUM-237	J	B09DR1	TRACER RECOVERY BELOW 20% BUT GREATER THAN 5% LIMIT
URANIUM-235	J/UJ	B09DQ6 B09DQ8	MINIMUM DETECTABLE ACTIVITIES NOT VERIFIABLE BY RECALCULATION

9713517.1558

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ0		B09DQ1		B09DQ2		B09DQ6		B09DQ7		B09DQ8	
	Date	12-3-93		12-6-93		12-7-93		12-9-93		12-13-93		12-13-93	
	Location	U-8 CRIB		U-8 CRIB		---		U-1 CRIB		U-1 CRIB		U-8 CRIB	
	Depth	4.00 - 6.00		15.50 - 17.50		---		40.50 - 42.50		50.00 - 52.00		38.00 - 40.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	7.900		8.500		5.700		2000.000		17.000		110.000	
GROSS BETA	pCi/g	16.000		10.000		14.000		19000.000		29.000		2100.000	
SELENIUM-79	pCi/g	2.000	U	1.000	U	2.000	U	3.000	U	2.000	U	4.000	UJ
STRONTIUM-90	pCi/g	0.500	U	0.500	U	0.900	U	8500.000		1.000	U	130.000	
TECHNETIUM-99	pCi/g	0.200	U	0.400	UJ	1.000	UJ	350.000		6.400		1.000	U
IODINE-129	pCi/g	2.000	U	2.000	U	2.000	U	1.000	U	2.000	U	2.000	U
URANIUM-233/234	pCi/g	0.580		0.440		0.770		1400.000		7.600		28.000	
URANIUM-235	pCi/g	0.090	U	0.040	U	0.030	U	40.000	UJ	0.540		1.100	J
URANIUM-238	pCi/g	0.550		0.430		0.840		1500.000		7.400		29.000	
TOTAL URANIUM	UG/G	1.500		1.300		2.200		4300.000		23.000		88.000	
NEPTUNIUM-237	pCi/g	0.019		0.03	U	0.020	U	2.100		0.030	U	0.050	U
PLUTONIUM-238	pCi/g	0.020	U	0.040	U	0.050	U	0.050	U	0.070	U	0.070	U
PLUTONIUM-239/240	pCi/g	0.020	U	0.040	U	0.030	U	1.100		0.030	U	0.050	U
AMERICIUM-241	pCi/g	0.010	U	0.010	U	0.010	U	1.100		0.012		0.200	
CURIUM-244	pCi/g	0.010	U	0.010	U	0.010	U	0.030	U	0.010	U	0.030	U
SODIUM-22	pCi/g	0.200	U	0.200	U	0.080	U	1.000	U	0.200	U	1.000	U
POTASSIUM-40	pCi/g	14.000		12.000		11.000		13.000		13.000		15.000	
MANGANESE-54	pCi/g	0.200	U	0.100	U	0.060	U	0.700	U	0.200	U	0.300	U
IRON-59	pCi/g	0.600	U	0.500	U	0.200	U	1.000	U	0.500	U	0.900	U
COBALT-58	pCi/g	0.200	U	0.200	U	0.070	U	0.900	U	0.200	U	0.400	U
COBALT-60	pCi/g	0.200	U	0.300	U	0.080	U	0.370		0.200	U	0.550	
NIOBIUM-94	pCi/g	0.200	U	0.200	U	0.060	U	0.700	U	0.100	U	0.300	U
RUTHENIUM-103	pCi/g	0.200	U	0.200	U	0.080	U	1.000	U	0.200	U	3.000	U
RUTHENIUM-106	pCi/g	1.000	U	2.000	U	0.500	U	7.000	U	1.000	U	10.000	U
TIN-113	pCi/g	0.200	U	0.300	U	0.070	U	1.000	U	0.200	U	3.000	U
CESIUM-134	pCi/g	0.200	U	0.200	U	0.070	U	0.900	U	0.200	U	0.400	U
CESIUM-137	pCi/g	0.200	U	0.200	U	0.060	U	0.900		0.100	U	1700.000	
CERIUM-144	pCi/g	0.600	U	0.700	U	0.200	U	6.000	U	0.500	U	6.000	U
EUROPIUM-152	pCi/g	0.200	U	0.300	U	0.090	U	2.000	U	0.200	U	6.000	U
EUROPIUM-154	pCi/g	0.200	U	0.200	U	0.050	U	2.000		0.100	U	3.100	
EUROPIUM-155	pCi/g	0.300	U	0.300	U	0.100	U	4.000	U	0.300	U	4.500	
RADIUM-226	pCi/g	0.760		0.500	U	0.490		1.000	U	0.380		2.000	U
RADIUM-228	pCi/g	1.200		0.830		0.530		2.000	U	1.000		2.100	
THORIUM-228	pCi/g	0.940		0.810		0.530		1.000	U	0.900		2.000	U
THORIUM-232	pCi/g	1.200		0.830		0.530		2.000	U	1.000		2.100	

Verified 4-25-94
RS

9/1559/1559

009

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DQ9		B09DR0		B09DR1		B09DR3		B09DR4		B09DR5	
	Date	12-14-93		12-14-93		12-15-93		12-14-93		12-16-93		12-16-93	
	Location	U-8 CRIB		U-8 CRIB		U-1 CRIB		U-8 CRIB		U-1 CRIB		U-8 CRIB	
	Depth	48.00 - 50.00		57.50 - 59.50		60.00 - 62.00		68.00 - 70.00		80.00 - 82.00		89.50 - 91.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	8.800		17.000		17.000		11.000		29.000		19.000	
GROSS BETA	pCi/g	160.000		220.000		26.000		120.000		41.000		140.000	
SELENIUM-79	pCi/g	1.000	U	1.000	U	1.000	U	2.000	U	2.000	U	2.000	U
STRONTIUM-90	pCi/g	64.000		60.000		0.700	U	49.000		1.000	U	36.000	
TECHNETIUM-99	pCi/g	0.200	U	0.300	U	4.200		0.400	U	11.000		0.460	
IODINE-129	pCi/g	2.000	U	2.000	U	2.000	U	2.000	U	2.000	U	2.000	U
URANIUM-233/234	pCi/g	4.400		6.300		3.200		5.000		13.000		6.800	
URANIUM-235	pCi/g	0.320		0.380		0.180		0.380		1.000		0.390	
URANIUM-238	pCi/g	4.300		6.200		3.300		5.100		14.000		7.000	
TOTAL URANIUM	UG/G	13.000		18.000		8.700		15.000		43.000		19.000	
NEPTUNIUM-237	pCi/g	0.020	U	0.010	U	0.041	J	0.020	U	0.060	U	0.040	U
PLUTONIUM-238	pCi/g	0.080	U	0.020	U	0.050	U	0.080	U	0.030	U	0.050	U
PLUTONIUM-239/240	pCi/g	0.040	U	0.020	U	0.030	U	0.040	U	0.020	U	0.050	U
AMERICIUM-241	pCi/g	0.010	U	0.010	U	0.010	U	0.020	U	0.010	U	0.020	U
CURIUM-244	pCi/g	0.014		0.010	U	0.010	U	0.010	U	0.010		0.020	U
SODIUM-22	pCi/g	0.200	U	0.300	U	0.200	U	0.200	U	0.100	U	0.200	U
POTASSIUM-40	pCi/g	15.000		17.000		13.000		19.000		9.400		13.000	
MANGANESE-54	pCi/g	0.100	U	0.200	U	0.200	U	0.200	U	0.100	U	0.200	U
IRON-59	pCi/g	0.300	U	0.500	U	0.400	U	0.500	U	0.400	U	0.500	U
COBALT-58	pCi/g	0.200	U	0.200	U	0.200	U	0.200	U	0.100	U	0.200	U
COBALT-60	pCi/g	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U	0.200	U
NIOBIUM-94	pCi/g	0.100	U	0.200	U	0.100	U	0.200	U	0.100	U	0.200	U
RUTHENIUM-103	pCi/g	0.200	U	0.600	U	0.200	U	0.200	U	0.200	U	0.400	U
RUTHENIUM-106	pCi/g	1.000	U	3.000	U	1.000	U	1.000	U	1.000	U	2.000	U
TIN-113	pCi/g	0.200	U	0.500	U	0.100	U	0.200	U	0.100	U	0.400	U
CESIUM-134	pCi/g	0.200	U	0.300	U	0.200	U	0.200	U	0.100	U	0.200	U
CESIUM-137	pCi/g	3.400		56.000		0.200	U	0.780		0.100	U	29.000	
CERIUM-144	pCi/g	0.700	U	1.000	U	0.500	U	0.700	U	0.600	U	1.000	U
EUROPIUM-152	pCi/g	0.300	U	0.500	U	0.200	U	0.300	U	0.200	U	0.400	U
EUROPIUM-154	pCi/g	0.200	U	0.300	U	0.100	U	0.200	U	0.200	U	0.300	U
EUROPIUM-155	pCi/g	0.400	U	0.600	U	0.200	U	0.400	U	0.400	U	0.600	U
RADIUM-226	pCi/g	0.440		0.610		0.480		0.460		0.310		1.100	
RADIUM-228	pCi/g	0.710		1.700		1.000	U	1.100		0.970		1.000	
THORIUM-228	pCi/g	0.600		1.200		0.630		0.810		0.350		1.400	
THORIUM-232	pCi/g	0.710		1.700		1.000	U	1.100		0.970		1.000	

Verified 4-11-94

Validated Data Summary, Data Package: B09DQ6-TMA-681

	Samp#	B09DR6	
	Date	12-20-93	
	Location	U-1 CRIB	
	Depth	99.50 - 101.50	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
GROSS ALPHA	pCi/g	17.000	
GROSS BETA	pCi/g	33.000	
SELENIUM-79	pCi/g	2.000	U
STRONTIUM-90	pCi/g	1.000	U
TECHNETIUM-99	pCi/g	2.100	
IODINE-129	pCi/g	2.000	U
URANIUM-233/234	pCi/g	3.700	
URANIUM-235	pCi/g	0.200	
URANIUM-238	pCi/g	3.700	
TOTAL URANIUM	UG/G	11.000	
NEPTUNIUM-237	pCi/g	0.050	U
PLUTONIUM-238	pCi/g	0.070	U
PLUTONIUM-239/240	pCi/g	0.060	U
AMERICIUM-241	pCi/g	0.020	U
CURIUM-244	pCi/g	0.010	U
SODIUM-22	pCi/g	0.200	U
POTASSIUM-40	pCi/g	16.000	
MANGANESE-54	pCi/g	0.200	U
IRON-59	pCi/g	0.600	U
COBALT-58	pCi/g	0.200	U
COBALT-60	pCi/g	0.200	U
NIOBIUM-94	pCi/g	0.200	U
RUTHENIUM-103	pCi/g	0.200	U
RUTHENIUM-106	pCi/g	2.000	U
TIN-113	pCi/g	0.300	U
CESIUM-134	pCi/g	0.300	U
CESIUM-137	pCi/g	0.200	U
CERIUM-144	pCi/g	0.900	U
EUROPIUM-152	pCi/g	0.400	U
EUROPIUM-154	pCi/g	0.300	U
EUROPIUM-155	pCi/g	0.500	U
RADIUM-226	pCi/g	0.490	
RADIUM-228	pCi/g	1.100	
THORIUM-228	pCi/g	1.300	
THORIUM-232	pCi/g	1.100	

Verified FS 4-11-94

9415717.1561

9713517.1562

N312021-01

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ0

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-01 | Client sample id B09DQ0
Dept sample id 7304-001 | Location/Matrix 200-UP-2 SOLID
Received 12/08/93 | Collected 12/03/93
% moisture 5.9 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	7.9	3.9	4	10	~~J~~	80A
Gross Beta	Beta	16	4.7	6	10		80B
Selenium 79	15758-45-9	~~1.2~~	~~0.91~~	2	10	U	SE
Strontium 90	10098-97-2	~~0.22~~	~~0.23~~	0.5	1	U	Y
Technetium 99	14133-76-7	~~0.030~~	~~0.076~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.076~~	~~0.77~~	2	2	U	I
Uranium 233/234		0.58	0.16	0.09	0.3		U
Uranium 235	15117-96-1	~~0.024~~	~~0.047~~	0.09	0.3	U	U
Uranium 238		0.55	0.15	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.30	0.02	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	0.019	0.019	0.01	0.2	~~J~~	NP
Plutonium 238	13981-16-3	~~0.008~~	~~0.011~~	0.02	0.05	U	PU
Plutonium 239/240		~~0.005~~	~~0.005~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.004~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	14	3.3				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.6	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified 4-11-94

9713517.1563

TMA NORCAL
REPORTING GROUP 7304

N312021-01

DATA SHEET, cont

B09DQ0

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-01	Client sample id	B09DQ0
Dept sample id	7304-001	Location/Matrix	200-UP-2 SOLID
Received	12/08/93	Collected	12/03/93
% moisture	5.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.6		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	0.76	0.34				GAM
Radium 228	15262-20-1	1.2	0.71				GAM
Thorium 228	14274-82-9	0.94	0.18				GAM
Thorium 232	7440-29-1	1.2	0.71				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1564

N312021-02

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ1

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-02 | Client sample id B09DQ1
Dept sample id 7304-002 | Location/Matrix 200-UP-2 SOLID
Received 12/08/93 | Collected 12/06/93
% moisture 5.9 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	8.5	3.7	3	10	~~J~~	80A
Gross Beta	Beta	10	4.4	6	10		80B
Selenium 79	15758-45-9	~~0.42~~	~~0.80~~	1	10	U	SE
Strontium 90	10098-97-2	~~0.057~~	~~0.19~~	0.5	1	U	Y
Technetium 99	14133-76-7	~~0.083~~	~~0.14~~	0.4	0.5	U J	TC
Iodine 129	15046-84-1	~~0.41~~	~~0.90~~	2	2	U	I
Uranium 233/234		0.44	0.089	0.06	0.3		U
Uranium 235	15117-96-1	~~0.039~~	~~0.035~~	0.04	0.3	U	U
Uranium 238		0.43	0.082	0.04	0.3		U
Total Uranium (ug/g)	7440-61-1 ★	1.3	0.26	0.02	0.1	~~X~~	U_T
Neptunium 237	13994-20-2 See Below	~~2.4~~	~~0.22~~	~~0.04~~	0.2		NP
Plutonium 238	13981-16-3	~~0~~	~~0.010~~	0.04	0.05	U	PU
Plutonium 239/240		~~0~~	~~0.010~~	0.04	0.05	U	PU
Americium 241	14596-10-2	~~0.004~~	~~0.006~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0~~	~~0.006~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	12	3.4				GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.3	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

★ The updated neptunium-237 result follows on a supplemental Laboratory report page for sample B09DQ1.

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified RS 4-11-94

9213517.1565

N312021-02

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-02	Client sample id	B09DQ1
Dept sample id	7304-002	Location/Matrix	200-UP-2 SOLID
Received	12/08/93	Collected	12/06/93
% moisture	5.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	U		0.5		U	GAM
Radium 228	15262-20-1	0.83	0.70				GAM
Thorium 228	14274-82-9	0.81	0.25				GAM
Thorium 232	7440-29-1	0.83	0.70				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1566

N312021-02

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-02	Client sample id	B09DQ1
Dept sample id	7304-002	Location/Matrix	200-UP-2 SOLID
Received	12/08/93	Collected	12/06/93
% moisture	5.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	N.R.			10		80A
Gross Beta	Beta	N.R.			10		80B
Strontium 90	10098-97-2	N.R.			1		Y
Technetium 99	14133-76-7	N.R.			0.5		TC
Iodine 129	15046-84-1	N.R.			2		I
Uranium 233/234		N.R.			0.3		U
Uranium 235	15117-96-1	N.R.			0.3		U
Uranium 238		N.R.			0.3		U
Total Uranium (ug/g)	7440-61-1	N.R.			0.1		U_T
Neptunium 237	13994-20-2	★ ~~0.012~~	~~0.016~~	0.03	0.2	U	NP
Plutonium 238	13981-16-3	N.R.			0.05		PU
Plutonium 239/240		N.R.			0.05		PU
Americium 241	14596-10-2	N.R.			0.05		TP
Curium 244	13981-15-2	N.R.			0.05		TP

Verified RS 4-22-94

★ Result provided above is the updated analysis performed on 2-24-94 and supersedes result on previous laboratory ~~form~~ report form.

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RS 4-22-94

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Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
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9713517.1567

N312021-03

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ6

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-03 | Client sample id B09DQ6
Dept sample id 7304-003 | Location/Matrix 200-UP-2 SOLID
Received 12/15/93 | Collected 12/09/93
% moisture 9.4 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	2000	50	4	10		80A
Gross Beta	Beta	19000	90	7	10		80B
Selenium 79	15758-45-9	~~0.43~~	~~2.0~~	3	10	U	SE
Strontium 90	10098-97-2	8500	130	0.9	1		Y
Technetium 99	14133-76-7	350	5.6	1	0.5		TC
Iodine 129	15046-84-1	~~0.11~~	~~0.64~~	1	2	U	I
Uranium 233/234		1400	75	5	0.3		U
Uranium 235	15117-96-1	~~22~~	~~20~~	40	0.3	~~U~~ UJ	U 4/22/94
Uranium 238		1500	77	4	0.3		U
Total Uranium (ug/g)	7440-61-1	4300	950	2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	2.1	0.21	0.02	0.2		NP
Plutonium 238	13981-16-3	~~0.006~~	~~0.032~~	0.05	0.05	U	PU
Plutonium 239/240		1.1	0.14	0.05	0.05		PU
Americium 241	14596-10-2	1.1	0.10	0.03	0.05		TP
Curium 244	13981-15-2	~~0.003~~	~~0.013~~	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		1		U	GAM
Potassium 40	13966-00-2	13	3.7				GAM
Manganese 54	13966-31-9	U		0.7		U	GAM
Iron 59	14596-12-4	U		1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.9	0.05	U	GAM
Cobalt 60	10198-40-0	0.37	0.25		0.05		GAM
Niobium 94	14681-63-1	U		0.7		U	GAM
Ruthenium 103	13968-53-1	U		1		U	GAM
Ruthenium 106	13967-48-1	U		7		U	GAM
Tin 113	13966-06-8	U		1		U	GAM
Cesium 134	13967-70-9	U		0.9		U	GAM
Cesium 137	10045-97-3	0.90	0.65		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified 4-11-94

9713517.1568

N312021-03

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ6

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-03	Client sample id	B09DQ6
Dept sample id	7304-003	Location/Matrix	200-UP-2 SOLID
Received	12/15/93	Collected	12/09/93
% moisture	9.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		6		U	GAM
Europium 152	14683-23-9	U		2	0.1	U	GAM
Europium 154	15585-10-1	2.0	1.2		0.1		GAM
Europium 155	14391-16-3	U		4	0.1	U	GAM
Radium 226	13982-63-3	U		1		U	GAM
Radium 228	15262-20-1	U		2		U	GAM
Thorium 228	14274-82-9	U		1		U	GAM
Thorium 232	7440-29-1	U		2		U	GAM

Verified fs
4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9213512.1569

N312021-04

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR0

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-04	Client sample id	B09DR0
Dept sample id	7304-004	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	4.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	5.4	4	10		80A
Gross Beta	Beta	220	10	6	10		80B
Selenium 79	15758-45-9	~~0.16~~	~~0.89~~	1	10	U	SE
Strontium 90	10098-97-2	60	2.7	0.6	1		Y
Technetium 99	14133-76-7	~~0.29~~	~~0.13~~	0.3	0.5	U	TC
Iodine 129	15046-84-1	~~1.0~~	~~0.80~~	2	2	U	I
Uranium 233/234		6.3	0.40	0.06	0.3		U
Uranium 235	15117-96-1	0.38	0.074	0.04	0.3		U
Uranium 238		6.2	0.39	0.06	0.3		U
Total Uranium (ug/g)	7440-61-1	18	3.7	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.004~~	~~0.007~~	0.01	0.2	U	NP
Plutonium 238	13981-16-3	~~0.006~~	~~0.013~~	0.02	0.05	U	PU
Plutonium 239/240		~~0~~	~~0.006~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.003~~	~~0.006~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.001~~	~~0.003~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.3		U	GAM
Potassium 40	13966-00-2	17	3.5				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.6		U	GAM
Ruthenium 106	13967-48-1	U		3		U	GAM
Tin 113	13966-06-8	U		0.5		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	56	1.2		0.05		GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1570

N312021-04

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DR0

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-04	Client sample id	B09DR0
Dept sample id	7304-004	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	4.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.5	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.6	0.1	U	GAM
Radium 226	13982-63-3	0.61	0.58				GAM
Radium 228	15262-20-1	1.7	0.83				GAM
Thorium 228	14274-82-9	1.2	0.52				GAM
Thorium 232	7440-29-1	1.7	0.83				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1571

N312021-05

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-05	Client sample id	B09DR1
Dept sample id	7304-005	Location/Matrix	200-UP-1 SOLID
Received	12/20/93	Collected	12/15/93
% moisture	3.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	5.1	4	10		80A
Gross Beta	Beta	26	4.8	6	10		80B
Selenium 79	15758-45-9	~~0.57~~	~~0.77~~	1	10	U	SE
Strontium 90	10098-97-2	~~0.42~~	~~0.26~~	0.7	1	U	Y
Technetium 99	14133-76-7	4.2	0.37	0.3	0.5		TC
Iodine 129	15046-84-1	~~0.021~~	~~0.71~~	2	2	U	I
Uranium 233/234		3.2	0.25	0.05	0.3		U
Uranium 235	15117-96-1	0.18	0.051	0.03	0.3	~~J~~	U
Uranium 238		3.3	0.26	0.04	0.3		U
Total Uranium (ug/g)	7440-61-1	8.7	1.7	0.02	0.1		U_T
Neptunium 237	13994-20-2	0.041	0.027	0.02	0.2	~~J~~ J	NP
Plutonium 238	13981-16-3	~~0.015~~	~~0.029~~	0.05	0.05	U	PU
Plutonium 239/240		~~0.002~~	~~0.010~~	0.03	0.05	U	PU
Americium 241	14596-10-2	~~0.003~~	~~0.006~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.006~~	~~0.006~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	13	2.5				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.4	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1572

N312021-05

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DR1

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-05	Client sample id	B09DR1
Dept sample id	7304-005	Location/Matrix	200-UP-1 SOLID
Received	12/20/93	Collected	12/15/93
% moisture	3.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.5		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.48	0.25				GAM
Radium 228	15262-20-1	U		1		U	GAM
Thorium 228	14274-82-9	0.63	0.14				GAM
Thorium 232	7440-29-1	U		1		U	GAM

Verified FS 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1573

N312021-06

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR3

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-06	Client sample id	B09DR3
Dept sample id	7304-006	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	1.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	11	4.4	4	10		80A
Gross Beta	Beta	120	8.1	6	10		80B
Selenium 79	15758-45-9	~~0~~	~~0~~	2	10	U	SE
Strontium 90	10098-97-2	49	3.4	0.9	1		Y
Technetium 99	14133-76-7	~~0.31~~	~~0.15~~	0.4	0.5	U	TC
Iodine 129	15046-84-1	~~0.19~~	~~0.71~~	2	2	U	I
Uranium 233/234	RE 4-11-94	~~5.0~~	~~0.36~~	0.07	0.3		U
Uranium 235	15117-96-1	0.38	0.076	0.04	0.3		U
Uranium 238		5.1	0.36	0.06	0.3		U
Total Uranium (ug/g)	7440-61-1	15	3.1	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.011~~	~~0.011~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0.007~~	~~0.044~~	0.08	0.05	U	PU
Plutonium 239/240		~~0.015~~	~~0.022~~	0.04	0.05	U	PU
Americium 241	14596-10-2	~~0~~	~~0.011~~	0.02	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	19	3.5				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	0.78	0.21		0.05		GAM

Verified RE 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1574

TMA NORCAL
REPORTING GROUP 7304

N312021-06

DATA SHEET, cont

B09DR3

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-06	Client sample id	B09DR3
Dept sample id	7304-006	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/14/93
% moisture	1.9	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.4	0.1	U	GAM
Radium 226	13982-63-3	0.46	0.27				GAM
Radium 228	15262-20-1	1.1	0.81				GAM
Thorium 228	14274-82-9	0.81	0.13				GAM
Thorium 232	7440-29-1	1.1	0.81				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1575

N312021-07

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ2

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-07 | Client sample id B09DQ2
Dept sample id 7304-007 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/07/93
% moisture 3.6 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	5.7	3.8	4	10 RS	~~J~~ ~~J~~	80A
Gross Beta	Beta	14	4.2	6	10 4/20		80B
Selenium 79	15758-45-9	~~0.66~~	~~1.2~~	2	10	U	SE
Strontium 90	10098-97-2	~~0.68~~	~~0.31~~	0.9	1	U	Y
Technetium 99	14133-76-7	~~0.039~~	~~0.33~~	1	0.5	U J	TC
Iodine 129	15046-84-1	~~0.10~~	~~0.76~~	2	2	U	I
Uranium 233/234		0.77	0.11	0.05	0.3		U
Uranium 235	15117-96-1	~~0.024~~	~~0.024~~	0.03	0.3	U	U
Uranium 238		0.84	0.11	0.04	0.3		U
Total Uranium (ug/g)	7440-61-1	2.2	0.43	0.02	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.003~~	~~0.010~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0.007~~	~~0.028~~	0.05	0.05	U	PU
Plutonium 239/240		~~0.007~~	~~0.014~~	0.03	0.05	U	PU
Americium 241	14596-10-2	~~0.001~~	~~0.005~~	0.01	0.05	U	TP
Curium 244	13981-15-2	~~0.001~~	~~0.006~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.08		U	GAM
Potassium 40	13966-00-2	11	1.3				GAM
Manganese 54	13966-31-9	U		0.06		U	GAM
Iron 59	14596-12-4	U		0.2	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.07	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.08	0.05	U	GAM
Niobium 94	14681-63-1	U		0.06		U	GAM
Ruthenium 103	13968-53-1	U		0.08		U	GAM
Ruthenium 106	13967-48-1	U		0.5		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.07		U	GAM
Cesium 137	10045-97-3	U		0.06	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified 4-11-94

N312021-07

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ2

SDG 7304 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N312021-07 Client sample id B09DQ2
Dept sample id 7304-007 Location/Matrix 200-UP-2 SOLID
Received 12/20/93 Collected 12/07/93
% moisture 3.6 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.2		U	GAM
Europium 152	14683-23-9	U		0.09	0.1	U	GAM
Europium 154	15585-10-1	U		0.05	0.1	U	GAM
Europium 155	14391-16-3	U		0.1	0.1	U	GAM
Radium 226	13982-63-3	0.49	0.15				GAM
Radium 228	15262-20-1	0.53	0.21				GAM
Thorium 228	14274-82-9	0.53	0.070				GAM
Thorium 232	7440-29-1	0.53	0.21				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified 4-11-94

9713517.1577

N312021-08

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ7

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-08 | Client sample id B09DQ7
Dept sample id 7304-008 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/13/93
% moisture 2.6 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	5.1	3	10		80A
Gross Beta	Beta	29	5.3	6	10		80B
Selenium 79	15758-45-9	~~0.59~~	~~1.0~~	2	10	U	SE
Strontium 90	10098-97-2	~~0.23~~	~~0.35~~	1	1	U	Y
Technetium 99	14133-76-7	6.4	0.46	0.3	0.5		TC
Iodine 129	15046-84-1	~~0.26~~	~~0.92~~	2	2	U	I
Uranium 233/234		7.6	0.52	0.08	0.3		U
Uranium 235	15117-96-1	0.54	0.10	0.04	0.3		U
Uranium 238		7.4	0.51	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	23	4.8	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.020~~	~~0.020~~	0.03	0.2	U	NP
Plutonium 238	13981-16-3	~~0.023~~	~~0.039~~	0.07	0.05	U	PU
Plutonium 239/240		~~0.006~~	~~0.013~~	0.03	0.05	U	PU
Americium 241	14596-10-2	0.012	0.011	0.01	0.05	~~J~~	TP
Curium 244	13981-15-2	~~0.007~~	~~0.008~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	13	3.0				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified TS 4-11-94

9213517.1578

N312021-08

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ7

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-08	Client sample id	B09DQ7
Dept sample id	7304-008	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/13/93
% moisture	2.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.5		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.1	0.1	U	GAM
Europium 155	14391-16-3	U		0.3	0.1	U	GAM
Radium 226	13982-63-3	0.38	0.25				GAM
Radium 228	15262-20-1	1.0	0.53				GAM
Thorium 228	14274-82-9	0.90	0.24				GAM
Thorium 232	7440-29-1	1.0	0.53				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9213517.1579

N312021-09

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ8

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-09 | Client sample id B09DQ8
Dept sample id 7304-009 | Location/Matrix 200-UP-2 SOLID
Received 12/20/93 | Collected 12/13/93
% moisture 10.4 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	110	14	4	10		80A
Gross Beta	Beta	2100	30	6	10		80B
Selenium 79	15758-45-9	~~0.38~~	~~2.5~~	4	10	U J	SE
Strontium 90	10098-97-2	130	4.0	0.8	1		Y
Technetium 99	14133-76-7	~~0.85~~	~~0.43~~	1	0.5	U	TC
Iodine 129	15046-84-1	~~0.51~~	~~0.80~~	2	2	U	I
Uranium 233/234		28	1.2	0.08	0.3		U
Uranium 235	15117-96-1	1.1	0.29	0.6	0.3	/ J	U 4-2
Uranium 238		29	1.3	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	88	18	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.035~~	~~0.029~~	0.05	0.2	U	NP
Plutonium 238	13981-16-3	~~0.015~~	~~0.040~~	0.07	0.05	U	PU
Plutonium 239/240		~~0.010~~	~~0.030~~	0.05	0.05	U	PU
Americium 241	14596-10-2	0.20	0.045	0.03	0.05		TP
Curium 244	13981-15-2	~~0.010~~	~~0.016~~	0.03	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		1		U	GAM
Potassium 40	13966-00-2	15	3.3				GAM
Manganese 54	13966-31-9	U		0.3		U	GAM
Iron 59	14596-12-4	U		0.9	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.4	0.05	U	GAM
Cobalt 60	10198-40-0	0.55	0.30		0.05		GAM
Niobium 94	14681-63-1	U		0.3		U	GAM
Ruthenium 103	13968-53-1	U		3		U	GAM
Ruthenium 106	13967-48-1	U		10		U	GAM
Tin 113	13966-06-8	U		3		U	GAM
Cesium 134	13967-70-9	U		0.4		U	GAM
Cesium 137	10045-97-3	1700	8.0		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified 4-11-94

9713517.1580

TMA NORCAL
REPORTING GROUP 7304

N312021-09

DATA SHEET, cont

B09DQ8

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-09	Client sample id	B09DQ8
Dept sample id	7304-009	Location/Matrix	200-UP-2 SOLID
Received	12/20/93	Collected	12/13/93
% moisture	10.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		6		U	GAM
Europium 152	14683-23-9	U		6	0.1	U	GAM
Europium 154	15585-10-1	3.1	1.2		0.1		GAM
Europium 155	14391-16-3	4.5	2.2		0.1		GAM
Radium 226	13982-63-3	U		2		U	GAM
Radium 228	15262-20-1	2.1	1.3				GAM
Thorium 228	14274-82-9	U		2		U	GAM
Thorium 232	7440-29-1	2.1	1.3				GAM

Verified PC 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9213517.1581

N312021-10

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DQ9

SDG 7304 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N312021-10 Client sample id B09DQ9
Dept sample id 7304-010 Location/Matrix 200-UP-2 SOLID
Received 12/20/93 Collected 12/14/93
% moisture 2.6 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	8.8	3.9	3	10	~~J~~	80A
Gross Beta	Beta	160	9.2	6	10		80B
Selenium 79	15758-45-9	~~0.39~~	~~0.84~~	1	10	U	SE
Strontium 90	10098-97-2	64	3.0	0.9	1		Y
Technetium 99	14133-76-7	~~0.19~~	~~0.084~~	0.2	0.5	U	TC
Iodine 129	15046-84-1	~~0.068~~	~~0.80~~	2	2	U	I
Uranium 233/234		4.4	0.32	0.07	0.3		U
Uranium 235	15117-96-1	0.32	0.074	0.04	0.3		U
Uranium 238		4.3	0.31	0.05	0.3		U
Total Uranium (ug/g)	7440-61-1	13	2.7	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.018~~	~~0.014~~	0.02	0.2	U	NP
Plutonium 238	13981-16-3	~~0.050~~	~~0.050~~	0.08	0.05	U	PU
Plutonium 239/240		~~0.007~~	~~0.014~~	0.04	0.05	U	PU
Americium 241	14596-10-2	~~0.003~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	0.014	0.011	0.01	0.05	~~J~~	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	15	2.6				GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.3	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.2		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	3.4	0.32		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified FC 4-11-94

9713517.1582

N312021-10

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DQ9

SDG 7304 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N312021-10 Client sample id B09DQ9
Dept sample id 7304-010 Location/Matrix 200-UP-2 SOLID
Received 12/20/93 Collected 12/14/93
% moisture 2.6 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.7		U	GAM
Europium 152	14683-23-9	U		0.3	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.4	0.1	U	GAM
Radium 226	13982-63-3	0.44	0.26				GAM
Radium 228	15262-20-1	0.71	0.56				GAM
Thorium 228	14274-82-9	0.60	0.23				GAM
Thorium 232	7440-29-1	0.71	0.56				GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified RC 4-11-94

9713517.1583

N312021-11

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR4

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-11 | Client sample id B09DR4
Dept sample id 7304-011 | Location/Matrix 200-UP-2 SOLID
Received 12/22/93 | Collected 12/16/93
% moisture 3.0 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	29	6.5	4	10		80A
Gross Beta	Beta	41	5.7	6	10		80B
Selenium 79	15758-45-9	~~0.39~~	~~0.92~~	2	10	U	SE
Strontium 90	10098-97-2	~~0.64~~	~~0.55~~	1	1	U	Y
Technetium 99	14133-76-7	11	0.36	0.3	0.5		TC
Iodine 129	15046-84-1	~~0.59~~	~~0.81~~	2	2	U	I
Uranium 233/234		13	0.77	0.1	0.3		U
Uranium 235	15117-96-1	1.0	0.13	0.04	0.3		U
Uranium 238		14	0.79	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	43	8.9	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.004~~	~~0.028~~	0.06	0.2	U	NP
Plutonium 238	13981-16-3	~~0.006~~	~~0.011~~	0.03	0.05	U	PU
Plutonium 239/240		~~0.006~~	~~0.006~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.002~~	~~0.007~~	0.01	0.05	U	TP
Curium 244	13981-15-2	0.010	0.010	0.01	0.05	~~J~~	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.1		U	GAM
Potassium 40	13966-00-2	9.4	2.2				GAM
Manganese 54	13966-31-9	U		0.1		U	GAM
Iron 59	14596-12-4	U		0.4	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.1	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.1		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		1		U	GAM
Tin 113	13966-06-8	U		0.1		U	GAM
Cesium 134	13967-70-9	U		0.1		U	GAM
Cesium 137	10045-97-3	U		0.1	0.05	U	GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

Verified RS 4-11-94

9713512.1584

TMA NORCAL
REPORTING GROUP 7304

N312021-11

DATA SHEET, cont

B09DR4

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-11	Client sample id	B09DR4
Dept sample id	7304-011	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/16/93
% moisture	3.0	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.6		U	GAM
Europium 152	14683-23-9	U		0.2	0.1	U	GAM
Europium 154	15585-10-1	U		0.2	0.1	U	GAM
Europium 155	14391-16-3	U		0.4	0.1	U	GAM
Radium 226	13982-63-3	0.31	0.23				GAM
Radium 228	15262-20-1	0.97	0.68				GAM
Thorium 228	14274-82-9	0.35	0.16				GAM
Thorium 232	7440-29-1	0.97	0.68				GAM

Verified fs 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1585

N312021-12

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR5

SDG 7304 | Client Westinghouse Hanford
Contact Dinkar Kharkar | Contract MBH-SVV-069262

Lab sample id N312021-12 | Client sample id B09DR5
Dept sample id 7304-012 | Location/Matrix 200-UP-2 SOLID
Received 12/22/93 | Collected 12/16/93
% moisture 3.2 | Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	19	5.3	4	10		80A
Gross Beta	Beta	140	8.3	6	10		80B
Selenium 79	15758-45-9	~~0.71~~	~~0.90~~	2	10	U	SE
Strontium 90	10098-97-2	36	3.2	0.9	1		Y
Technetium 99	14133-76-7	0.46	0.11	0.3	0.5	~~J~~	TC
Iodine 129	15046-84-1	~~0~~	~~0.82~~	2	2	U	I
Uranium 233/234		6.8	0.64	0.1	0.3		U
Uranium 235	15117-96-1	0.39	0.11	0.06	0.3		U
Uranium 238		7.0	0.66	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	19	4.0	0.2	0.1	~~X~~	U_T
Neptunium 237	13994-20-2	~~0.003~~	~~0.016~~	0.04	0.2	U	NP
Plutonium 238	13981-16-3	~~0.010~~	~~0.010~~	0.05	0.05	U	PU
Plutonium 239/240		~~0~~	~~0.020~~	0.05	0.05	U	PU
Americium 241	14596-10-2	~~0.007~~	~~0.013~~	0.02	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.004~~	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	13	3.0				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.5	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.4		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.4		U	GAM
Cesium 134	13967-70-9	U		0.2		U	GAM
Cesium 137	10045-97-3	29	0.86		0.05		GAM

Verified 4-11-94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 02/18/94

9713517.1586

N312021-12

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET, cont

B09DR5

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-12	Client sample id	B09DR5
Dept sample id	7304-012	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/16/93
% moisture	3.2	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		1		U	GAM
Europium 152	14683-23-9	U		0.4	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.6	0.1	U	GAM
Radium 226	13982-63-3	1.1	0.46				GAM
Radium 228	15262-20-1	1.0	0.56				GAM
Thorium 228	14274-82-9	1.4	0.45				GAM
Thorium 232	7440-29-1	1.0	0.56				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1587

N312021-13

TMA NORCAL
REPORTING GROUP 7304

DATA SHEET

B09DR6

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-13	Client sample id	B09DR6
Dept sample id	7304-013	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/20/93
% moisture	7.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	17	4.9	4	10		80A
Gross Beta	Beta	33	5.1	6	10		80B
Selenium 79	15758-45-9	~~0.12~~	~~0.95~~	2	10	U	SE
Strontium 90	10098-97-2	~~0.27~~	~~0.33~~	1	1	U	Y
Technetium 99	14133-76-7	2.1	0.16	0.2	0.5		TC
Iodine 129	15046-84-1	~~0.31~~	~~0.78~~	2	2	U	I
Uranium 233/234		3.7	0.38	0.08	0.3		U
Uranium 235	15117-96-1	0.20	0.082	0.05	0.3	~~J~~	U
Uranium 238		3.7	0.39	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	11	2.1	0.02	0.1		U_T
Neptunium 237	13994-20-2	~~0.004~~	~~0.025~~	0.05	0.2	U	NP
Plutonium 238	13981-16-3	~~0.005~~	~~0.032~~	0.07	0.05	U	PU
Plutonium 239/240		~~0.016~~	~~0.022~~	0.06	0.05	U	PU
Americium 241	14596-10-2	~~0.003~~	~~0.010~~	0.02	0.05	U	TP
Curium 244	13981-15-2	~~0.002~~	~~0.003~~	0.01	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.2		U	GAM
Potassium 40	13966-00-2	16	3.3				GAM
Manganese 54	13966-31-9	U		0.2		U	GAM
Iron 59	14596-12-4	U		0.6	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.2	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.2	0.05	U	GAM
Niobium 94	14681-63-1	U		0.2		U	GAM
Ruthenium 103	13968-53-1	U		0.2		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.3		U	GAM
Cesium 134	13967-70-9	U		0.3		U	GAM
Cesium 137	10045-97-3	U		0.2	0.05	U	GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

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TMA NORCAL
REPORTING GROUP 7304

N312021-13

DATA SHEET, cont

B09DR6

SDG	7304	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N312021-13	Client sample id	B09DR6
Dept sample id	7304-013	Location/Matrix	200-UP-2 SOLID
Received	12/22/93	Collected	12/20/93
% moisture	7.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		0.9		U	GAM
Europium 152	14683-23-9	U		0.4	0.1	U	GAM
Europium 154	15585-10-1	U		0.3	0.1	U	GAM
Europium 155	14391-16-3	U		0.5	0.1	U	GAM
Radium 226	13982-63-3	0.49	0.35				GAM
Radium 228	15262-20-1	1.1	0.69				GAM
Thorium 228	14274-82-9	1.3	0.34				GAM
Thorium 232	7440-29-1	1.1	0.69				GAM

Verified 4-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	02/18/94

9713517.1589

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

TMA/Norcal

Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

February 18, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7304 is comprised of thirteen samples from location 200-UP-2, delivered under Chain-of-Custody document EFL-1091. One 1000 mL plastic bottle of each sample was received for analysis.

Samples B09DQ6 and B09DQ8 contained such high levels of uranium, technetium, and strontium-90 that it was necessary to analyze them separately in a lab area specifically designed to handle high level samples. All other samples were analyzed in the general environmental laboratory.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Strontium-90 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.5 Technetium-99 Analyses

Sample B09DQ2 had a low chemical yield of 18%, resulting in an MDA which exceeds the RDL. There was not enough sample to perform a reanalysis and no cause could be determined for the poor yield.

There was not enough of samples B09DQ6 and B09DQ8 to analyze nominal 2g aliquots, so 1g aliquots were taken. The MDA's exceed the RDL in each case. Sample B09DQ6 does contain positive technetium-99 activity, so the high MDA does not affect the validity of the data.

The found/added ratio for laboratory control sample 7304-17 is 83% which is just below the 3σ protocol limits of (85-115)% but within the contract limits of (80-120)%.

4-15-94

TMA/Norcal
Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

February 18, 1994

2.6 Iodine-129 Analyses

The found/added ratio for laboratory control sample 7304-014 is 151%, which exceeds both the 3σ protocol limits and the contract limits. No cause could be determined for the high recovery.

2.7 Total Uranium Analyses

The high uranium activity in sample B09DQ6 necessitated that a smaller than nominal aliquot be used for analysis.

The uranium MDA's of samples B09DQ7, B09DQ9, B09DR0, B09DR3, B09DR4, B09DR5, B09DQ6 and B09DQ8 are larger than the RDL. Because each of these samples contains positive uranium activity, the high MDA's do not affect the validity of the data.

2.8 Uranium-233/234, 235 and 238 Analyses

Reagent blank 7304-020 contains uranium-238 activity above the MDA, however, both the MDA and the result are well below the RDL.

The high uranium activity in sample B09DQ6 necessitated that a smaller than nominal aliquot be used for analysis. The uranium MDA's of samples B09DQ6 and B09DQ8 are larger than the RDL. Because both samples contain positive uranium activity, the high MDA's do not affect the validity of the data.

2.9 Neptunium-237 Analyses

The chemical yield of sample B09DR1 is slightly low (16%), however, the MDA meets the RDL.

2.10 Plutonium-238 and 239/240 Analyses

It is suspected that there were problems with the plutonium plating step which resulted in relatively low chemical yields throughout the analysis batch. All yields were within the (20-105)% range with the exception of B09DQ6, which was subsequently reanalyzed. Several sample MDA's are greater than the RDL because of these lower yields.

The found/added ratio for the laboratory control sample run with samples B09DQ6 and B09DQ8 is 122% which is just outside both the 3σ protocol limits of (79-121)% and the contract limits of (80-120)%.

4-5-94

TMA/Norcal
Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

February 18, 1994

2.11 Americium-241 and Curium-244 Analyses
Reagent blank 7304-020 contains americium-241 activity above the MDA, however, both the MDA and the result are well below the RDL.

2.12 Gamma Scan Analyses
There was not enough sample provided to analyze the nominal 750g necessary to meet MDA requirements. MDA's exceed the RDL's because of this.

4-5-94

TMA/Norcal
Report N3-12-021-7304
Sample Delivery Group 7304

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

April 1, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7304 is comprised of neptunium-237 reanalysis results for sample BO9DQ1. The sample is from Project Designation/Sampling Location 200-UP-2, delivered under Field Logbook No. EFL-1091. A Chain-of-Custody ID was not provided. One 1000 mL plastic bottle of sample was received for analysis.

2.0 ANALYSIS NOTES

2.1 Neptunium-237 Analyses

The original analysis results for samples BO9DQ1 and BO9DQ6 showed positive neptunium-237 activity. These samples also showed some uranium contamination so they were reanalyzed and the positive result for sample BO9DQ6 was confirmed. The reanalysis result for sample BO9DQ1 was below the MDA and the new result is provided in this report.

The found/added ratio for the laboratory control sample is 85% which is slightly below the 3σ protocol limits (88-112)%, but within the (80-120)% contract limits.

9713517.1594

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-03-93

Ice Chest No.: SML-369 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: T9733229 — Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DP9

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

LER 12-03-93

2) B09DQ0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

~~3)~~
~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

~~LER 12-03-93~~

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Loren E. Rogers 12-07-93	J.D. Franklin J.D. Franklin	12/7/93 1309
Relinquished by:	Received by:	Date/Time:
12/7/93 J.D. Franklin J.D. Franklin 1335	H. NARCISO	12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~28~~ FS 4-5-94

9713517.1595

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-06-93

Ice Chest No.: SML-369

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 997332291

Offsite Property No.:

Method of Shipment: AIR-Burlington

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DQ1

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

ABR 12-06-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

ABR 12-06-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
1305 Joseph Rogers 12-7-93	J.D. Fanher J.D. Fanher	12/7/93 1305
Relinquished by: J.D. Fanher J.D. Fanher 12/7/93 1335	Received by: Jessica Dze/H. NARCISO	Date/Time: 12-08-93 1:00 PM
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~100~~ 4-5-94

045

9713517.1596

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-07-93

Ice Chest No.: SML 386

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251 9008118

Offsite Property No.: WA4-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) 12-07-93 NONE NOTED

Sample Identification

1) B09DQ2

~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-07-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-17-93 Loren E. Rogers 1300	W.V. Setzer	12-17-93 1200
Relinquished by: W.V. Setzer	Received by: [illegible]	Date/Time: 12-20-93 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Real SATURDAY BUT opened 12-20-93
12-18-93
~~12-18~~ 4-5-94

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

046

9213517.1597

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L. E. ROGERS

Company Contact: L. E. ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-09-93

Ice Chest No.: SML-437

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ6

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-09-93

(3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-14-93 Lorene Rogers 0950	[illegible]	12-15-93 10:15 A.M.
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~.02~~ 4-5-94

047

9713517.1598

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09DQ7

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-13-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0715 Karen E. Rogers 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~10~~ 4-5-94

048

9713517.1599

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-13-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ8

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-13-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0945 Loren E Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA / NORCAL 12-18-93 ; opened 12-20-93 · KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~12~~ RB 4-5-94

L049

9213512.1600

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-14-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09DQ9

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR0

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml ~~P:CLP;TAL~~ Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

JER 12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Gorene E. Page 12-17-93	K. Blum Kermit Blum	* 12-20-93
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

* Received @ TMA/NORCAL 12-18-93 ; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~JA~~ 4-5-94

050

9213512.1601

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12-15-93

Ice Chest No.: SML 386 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008118 — Offsite Property No.: W94-0-0138-33

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR1

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2) B09DR2

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- ~~1,250ml aG:Semi-VOA CLP~~
- ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- ~~1,125ml G:Cyanide CLP~~
- ~~1,125ml Gw:Kerosene (8015M)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

3) ~~B09~~

- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

SER 12-14-93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Loren E. Rogers 12-17-93 1200	W. V. Selzer	12-17-93 1200
W. V. Selzer	[illegible]	12-20-93 8:00

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 4-5-94

Rec'd SATURDAY BUT opened 12-20-93 12-18-93

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

051

9713517.1602

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-14-93

Ice Chest No.:

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) 509DR3

~~1,250ml~~ P:CLP;TAL Metals,Hg,Ti
~~1,250ml~~ Gs:VOA CLP
~~1,250ml~~ aG:Semi-VOA CLP
~~1,125ml~~ G:Anions F,Cl,SO4 (EPA 300.0)
~~1,125ml~~ P/G:Anions NO2,NO3 (EPA 353.2)
~~1,125ml~~ G:Cyanide CLP
~~1,125ml~~ Gw:Kerosene (8015M)
~~1,1000ml~~ P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12-14-93

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0940 Loren E. Rogers 12-17-93	K. Blum Kermit Blum	12-20-93 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: ~~JJG~~ 4-5-94

* Received @ TMA/NORCAL 12-18-93; opened 12-20-93 KB

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

052

9213517.1603

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Franklin

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12/16/93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 251900 8217

Offsite Property No.: W94-0-0138#39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1)

B07DR4

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845		12.21.93 0846
Relinquished by:	Received by:	Date/Time:
		12-22-93 2:25
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~16~~ 4-5-94

053

9713517.1604

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / J.D. Fanh

Company Contact: L E ROGERS — Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 12/16/93

Ice Chest No.: SML-410 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1)

B09DR5

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

12/21/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0925 Loren E. Rogers 12-21-93	Jenise	12-22-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

~~118~~ 4-5-94

-054

9213517.1605

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 12-20-93

Ice Chest No.: SML 315

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519008217

Offsite Property No.: W94-0-0138 #39

Method of Shipment: AIR

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09DR6

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

2)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

3)

- 1,250ml P:CLP;TAL Metals,Hg,Ti
- 1,250ml Gs:VOA CLP
- 1,250ml aG:Semi-VOA CLP
- 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,125ml G:Cyanide CLP
- 1,125ml Gw:Kerosene (8015M)
- 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

LER 12-20-93

[] Field Transfer of Custody — Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
12-21-93 0845 Lorene E. Rogers	W.V. Setzer	12-21-93 0846
W.V. Setzer	[illegible]	12-22-93 2:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

4-5-94

055

9713517.1606

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9713517.1607

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200 UP-2		DATA PACKAGE: B09DQ6-TMA-681
VALIDATOR: T. Stapp	LAB: TMA / NORCAL	DATE: 4-4-94
CASE:		SDG:

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☐ Tritium	☑ Se-79		

SAMPLES/MATRIX B09DQØ, B09DQ1, B09DQ2, B09DQ6, B09DQ7, B09DQ8, B09DQ9, B09DRØ, B09DR1, ~~B09DR2~~, B09DR3, B09DR4, B09DR5, B09DR6 / SOIL

FS 4-4-94

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments: Performed by WHC

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . (Yes) No N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

057

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . Yes No N/A
Method blank results acceptable? . . . . . Yes No N/A
Analytes detected in method blank? . SEE NOTE ② . . . . Yes No N/A
Field blank(s) analyzed? . SEE NOTE ① . . . . . Yes No N/A
Field blank results acceptable? . . . . . Yes No N/A
Analytes detected in field blank(s)? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: ① Field QC data not identified with this sample set, but it has been requested. Field QC will be evaluated in final data summary. ② U-238 and Am-241 results above MDA for blank associated with B09DQ8 ~~and~~ (U-238) and B09DQ8, B09DQ6 (Am-241) respectively, however results of associated samples are greater than 5 times blank value and no qualification will be applied.

5. Matrix Spikes . . . . . ☒ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: Matrix Spikes not required when LCS data is provided

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . (Yes) No N/A
LCS recoveries acceptable? . SEE NOTE ① . . . . . Yes (No) N/A
LCS traceable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① I-129 LCS recovery exceeds 130% limit (151%) qualifying associated results greater than the MDA as estimated. Since no results are greater than MDA, no qualification applies.

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . (Yes) No N/A
Chemical recovery acceptable? . See Note ① . . . . . Yes (No) N/A
Chemical carrier traceable? . . . See Note ② . . . . . Yes (No) N/A
Chemical carrier expired? . . . . . Yes (No) N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A

Comments: ① Chem. carrier recoveries for selenium (B09DQ8), technetium (B09DQ1, B09DQ2) and tracer recovery for neptunium (B09DR1) are below 30% and 20% respectively, qualifying results as estimated (J/UJ).
② Tc-99 carrier supporting documentation not available. No qualif. applied.

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . SEE NOTE ① . . . . . (Yes) No N/A
RPD Values Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① QC batch duplicate analyzed on 1-27-94 is applicable to reanalysis of Np-237 for Sample B09DQ1, since laboratory submitted revised result from 2-24-94.

9. Field QC Samples . . . . NOTE ① . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No N/A
Field duplicate RPD values acceptable? . . . . . Yes No N/A
Field split sample(s) analyzed? . . . . . Yes No N/A
Field split RPD values acceptable? . . . . . Yes No N/A
Performance audit sample(s) analyzed? . . . . . Yes No N/A
Performance audit sample results acceptable? . . . . . Yes No N/A

Comments: ① Field QC data not identified in this sample set, but it has been requested. Field QC data will be evaluated in the final data summary.

10. Holding Times

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: See holding time Summary, page A-5.

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . Yes No N/A
Results supported in raw data? . . . . . Yes No N/A
Results Acceptable? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A
MDA's meet required detection limits? . See Note ① + ③ . Yes No N/A 4-22-94
Transcription/calculation errors? . See Note ② + ③ . . Yes No N/A

Comments: ① MDAs are greater than the RDL's for several samples and analytes due to low chemical recovery, high U activity and insufficient sample size provided to Laboratory. See Table 1 and case narrative (Np-237 and I-129)
② Recalculated MDA's do not match reported MDA's since Validator has not been provided with Lab SOP for calculation. However all reported MDAs are supported in the raw data and therefore no qualification will be applied.
③ MDA values not verifiable for U-235 by recalculation samples B09DQ6 and B09DQ8. Therefore results are estimated (J/UJ).

Comments: HOLDING TIME SUMMARY

Sample ID	Collect DATE	Gross α	Gross β	Total U	Sr90	Tc99	Se79	Uranium -234	Uranium -235	Uranium -238	Plutonium -238	Plutonium -239	Am	Cm	Np	I	Gamma
B09DQ0	12-3-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09DQ1	12-6-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09DQ2	12-7-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DQ6	12-9-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DQ7	12-13-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DQ8	12-13-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DQ9	12-14-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B09DR0	12-14-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DR1	12-15-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DR3	12-14-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DR4	12-16-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DR5	12-16-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DR6	12-20-93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
															✓		

✓ – Indicates analysis was performed within maximum 180 day holding period, and no qualification applies. RS 4-11-94

(✓) – Indicates same condition as above, but has been reverified since laboratory has submitted a reanalysis date. No qualif. applied. RS 4-22-94

Several laboratory applied qualifiers have been crossed out on the laboratory report sheets since they follow codes established by the laboratory for QC deficiencies, however they are not appropriate to evaluate data and do not appear in data validation procedures. Correct qualifiers have been applied where appropriate. RS 5-4-94

Table 1. Detection Limit Deficiencies **SDG: B09DQ6-TMA-681**

		SAMPLE ID/MDA												
Isotope	RDL	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6
Tc-99	0.5	--	--	1	1	--	1	--	--	--	--	--	--	--
Tot-U	0.1	--	--	--	2	0.2	0.2	0.2	0.2	--	0.2	0.2	0.2	--
U-233/4	0.3	--	--	--	5	--	--	--	--	--	--	--	--	--
U-235	0.3	--	--	--	40	--	0.6	--	--	--	--	--	--	--
U-238	0.3	--	--	--	4	--	--	--	--	--	--	--	--	--
Pu-238	0.05	--	--	--	--	0.07	0.07	0.08	--	--	0.08	--	--	0.07
Pu-239	0.05	--	--	--	--	--	--	--	--	--	--	--	--	0.06
Fe-59	0.05	0.6	0.5	0.2	1	0.5	0.9	0.3	0.5	0.4	0.5	0.4	0.5	0.6
Co-58	0.05	0.2	0.2	0.07	0.9	0.2	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Co-60	0.05	0.2	0.3	0.08	--	0.2	--	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cs-137	0.05	0.2	0.2	0.06	--	0.1	--	--	--	0.2	--	0.1	--	0.2
Eu-152	0.1	0.2	0.2	--	2	0.2	6	0.3	0.5	0.2	0.3	0.2	0.4	0.4
Eu-154	0.1	0.2	0.2	--	--	--	--	0.2	0.3	--	0.2	0.2	0.3	0.3
Eu-155	0.1	0.3	0.2	--	4	0.3	--	0.4	0.6	0.2	0.4	0.4	0.6	0.5

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Gross Alpha/Beta								
Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	114	103	113	102	114	105	103	105
Aliquot	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Count time	100	100	100	100	100	100	100	100
Alpha cpm	0.320	0.330	0.280	82.090	0.650	5.090	0.460	0.830
Alpha, Bkgd	0.058	0.044	0.089	0.076	0.058	0.092	0.044	0.084
Alpha, Xtalk	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff	0.144	0.149	0.145	0.163	0.150	0.152	0.164	0.16
Alpha Result Calc.	7.92	8.48	5.69	1977.46	17.29	113.56	8.92	17.48
Alpha Result Rptd.	7.9	8.50	5.70	2000.00	17.00	110.00	8.8	17
Alpha MDA Calc.	3.51	2.96	4.32	3.55	3.37	4.19	2.68	3.80
Alpha MDA Rptd.	4	3	4	4	3	4	3	4
Beta cpm	3.15	2.65	2.60	1763.08	4.46	196.99	16.94	22.52
Bkgd	1.60	1.64	1.23	1.91	1.60	1.69	1.636	1.538
Xtalk	0.264	0.270	0.263	0.255	0.260	0.259	0.254	0.256
Eff	0.421	0.422	0.421	0.423	0.422	0.422	0.423	0.423
Beta Result Calc.	15.90	10.00	14.13	18531.61	28.94	2070.86	161.84	221.40
Beta Result Rptd	16	10	14	19000	29	2100	160	220
Beta MDA Calc	6.30	6.36	5.53	6.85	6.28	6.46	6.35	6.15
Beta MDA rptd	6	6	6	7	6	6	6	6

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Gross Alpha/Beta								
Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP
Detector	108	111	105	108	111	113	114	113
Aliquot	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Count time	100	100	100	100	100	100	100	100
Alpha cpm	0.690	0.550	1.070	0.850	0.720	4.980	0.030	0.240
Alpha, Bkgd	0.073	0.087	0.084	0.073	0.087	0.098	0.058	0.066
Alpha, Xtalk	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff	0.155	0.164	0.149	0.162	0.165	0.133	0.126	0.159
Alpha Result Calc.	17.51	10.80	29.12	19.49	16.78	162.25	-1.01	4.73
Alpha Result Rptd.	17	11.00	29	19	17	160	-0.99	4.7
Alpha MDA Calc.	3.66	3.78	4.08	3.50	3.75	4.94	4.01	3.39
Alpha MDA Rptd.	4	4	4	4	4	5	4	3
Beta cpm	3.78	13.03	5.61	14.1	4.52	17.76	1.64	2.45
Bkgd	1.234	1.30	1.538	1.234	1.297	1.229	1.595	1.217
Xtalk	0.258	0.254	0.26	0.255	0.269	0.27	0.275	0.256
Eff	0.422	0.423	0.422	0.423	0.420	0.420	0.418	0.423
Beta Result Calc.	25.47	123.69	40.72	134.90	32.74	163.14	0.57	12.66
Beta Result Rptd	26	120	41	140	33	160	0.57	13
Beta MDA Calc	5.53	5.65	6.17	5.51	5.69	5.54	6.34	5.47
Beta MDA rptd	6	6	6	6	6	6	6	5

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064

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Selenium 79								
Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	5	5	5	5	5	5	5	5
Gross Counts	782	932	840	905	935	900	926	872
Count Time	150	150	150	150	150	150	150	150
Sample Amount	0.5	0.55	0.5	0.5	0.5	0.5	0.5	0.51
Bkgd cpm	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91
Decay Factor	1	1	1	1	1	1	1	1
Detector Eff.	0.724	0.755	0.778	0.767	0.764	0.77	0.719	0.76
Yield	0.7417	0.776	0.5481	0.3271	0.6415	0.2642	0.8458	0.7318
Result Calc.	-1.169	0.42	-0.65	0.44	0.59	0.40	0.39	-0.15
Result Rptd	-1.200	0.42	-0.66	0.43	0.59	0.38	0.39	-0.16
MDA Calc.	1.55	1.29	1.95	3.32	1.70	4.10	1.37	1.47
MDA Rptd.	2	1	2	3	2	4	1	1

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065

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Selenium 79							
Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-BLANK	B09DQ0-DUP
Detector	5	5	5	5	5	5	5
Gross Counts	950	887	923	822	898	857	869
Count Time	150	150	150	150	150	150	150
Sample Amount	0.5	0.52	0.5	0.51	0.5	0.5	0.51
Bkgd cpm	5.91	5.91	5.91	5.91	5.91	5.91	5.91
Decay Factor	1	1	1	1	1	1	1
Detector Eff.	0.75	0.765	0.759	0.766	0.787	0.779	0.764
Yield	0.89	0.4587	0.7348	0.7024	0.6788	0.832	0.7485
Result Calc.	0.57	0.01	0.39	-0.71	0.13	-0.27	-0.18
Result Rptd	0.57	0	0.39	-0.71	0.12	-0.28	-0.19
MDA Calc.	1.25	2.28	1.49	1.52	1.56	1.29	1.43
MDA Rptd.	1	2	2	2	2	1	1

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066

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Strontium 90								
Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	GRB204	GRB204	GRB210	GRB213	GRB211	GRB214	GRB212	GRB215
Bkg	0.4230	0.4230	0.4172	0.4968	0.5966	0.4688	0.487	0.3923
Count Time	81.500	100.000	33.000	33.000	33.000	33.000	33.000	57.370
Y90 cpm	0.205	0.056	0.605	8811.250	0.2	131.545	57.19	54.674
Elapsed Time, days	49.029	46.025	44.987	46.058	38.936	42.126	38.075	37.917
Lambda	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay	0.9966	0.9968	0.9969	0.9968	0.9973	0.9971	0.9974	0.9974
Yield	0.7681	0.8206	0.7453	0.8723	0.7285	0.8589	0.7487	0.7628
PPT. corr.	1	1	1	1	1	1	1	1
Aliquot	1	1	1	1	1	1	1	1
Product	0.7655	0.8180	0.7430	0.8695	0.7266	0.8564	0.7467	0.7608
C-zero	0.2683	0.0680	0.8146	10133	0.275	153.599	76.586	71.862
P-Factor	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.	0.225	0.057	0.682	8485.371	0.231	128.622	64.132	60.176
Result, rptd.	0.220	0.057	0.680	8500.000	0.230	130.000	64.000	60.000
MDA, calc.	0.478	0.461	0.724	0.924	0.846	0.884	0.786	0.545
MDA, rptd.	0.500	0.500	0.900	0.900	1.000	0.800	0.9	0.600

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067

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Strontium 90								
Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP
Detector	GRB216	GRB216	GRB209	GRB210	GRB211	GRB212	GRB207	GRB208
Bkg	0.4184	0.485	0.485	0.4172	0.5966	0.439	0.41	0.5287
Count Time	57.37	33	33	33	33	33	33	33
Y90 cpm	0.374	46.142	0.563	33.115	0.258	7.709	0	0.035
Elapsed Time, days	37.095	38.022	36.438	36.438	36.438	0	0	49.438
Lambda	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay	0.9975	0.9974	0.9975	0.9975	0.9975	1.0000	1.0000	0.9966
Yield	0.7513	0.7897	0.7413	0.7661	0.8138	0.7433	0.7722	0.666
PPT. corr.	1	1	1	1	1	1	1	1
Aliquot	1	1	1	1	1	1	1	1
Product	0.7494	0.7876	0.7394	0.7642	0.8118	0.7433	0.7722	0.6637
C-zero	0.499	58.582	0.761	43.334	0.318	10.371	0.000	0.053
P-Factor	1.859	1.859	1.859	1.859	1.859	1.859	1.859	1.859
Result, calc.	0.418	49.056	0.638	36.287	0.266	8.685	0.000	0.044
Result, rptd.	0.420	49.000	0.640	36.000	0.270	8.700	0.000	0.044
MDA, calc.	0.554	0.827	0.777	0.744	0.946	0.743	0.746	0.728
MDA, rptd.	0.7	0.9	1	0.9	1	1	0.9	1

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068

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Technetium 99								
Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	LBG 14	LBG 11	LBG 13	LBG 16	LBG 10	LBG 16	LBG 11	LBG 16
Aliquot	2.020	2.030	2.020	1.000	2.030	1.000	2.01	2
P-Factor	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Yield	0.569	0.222	0.179	0.322	0.636	0.330	0.6255	0.4605
Days	54.250	51.246	50.326	53.056	44.275	49.124	43.414	44.399
Lambda	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09
Decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net, cpm	0.030	0.040	0.010	108.050	7.780	0.260	0.220	0.260
Count, time	229.500	520.100	107.900	138.600	166.400	135.800	150.400	229.500
Bkg., cpm	0.590	0.510	0.570	0.630	0.620	0.610	0.5	0.61
Result, calc.	0.028	0.093	0.029	354.248	6.353	0.831	0.184	0.298
Result, rptd.	0.030	0.083	0.039	350.000	6.400	0.850	0.19	0.29
MDA, calc.	0.217	0.341	0.988	1.030	0.232	0.998	0.225	0.275
MDA, rptd.	0.200	0.400	1.000	1.000	0.300	1.000	0.2	0.3

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069

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Technetium 99								
Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP
Detector	LBG 13	LBG 15	LBG 15	LBG 13	LBG 9	LBG 13	LBG 13	LBG 13
Aliquot	2	2	2.02	2.02	2.02	2	2	2.03
P-Factor	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Yield	0.493	0.424	0.7314	0.5652	0.6901	0.5967	0.5897	0.6484
Days	42.434	43.361	41.777	41.861	41.861	0	0	54.861
Lambda	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09	8.91E-09
Decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net, cpm	3.930	0.250	14.910	0.490	2.750	16.960	0.040	0.130
Count, time	228.900	166.400	120.300	150.400	229.500	120.300	741.300	103.200
Bkg., cpm	0.57	0.63	0.63	0.56	0.55	0.56	0.57	0.57
Result, calc.	4.201	0.311	10.637	0.452	2.079	14.980	0.036	0.104
Result, rptd.	4.2	0.31	11	0.46	2.1	15	0.04	0.1
MDA, calc.	0.249	0.356	0.241	0.263	0.172	0.281	0.115	0.277
MDA, rptd.	0.3	0.4	0.3	0.3	0.2	0.3	0.1	0.3

9713517.1620

070

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Total Uranium	Standard	Intensity			Calc	UG/L	Prep/Dsvl	Final	Rptd
	0.049	247	Sample ID	Intens.	Result		Volume	Rslt	Rslt
	0.156	966	B09DQ0	11366	1.882	18.661	0.08	1.5	1.5
	0.521	3276	B09DQ1	9732	1.611	16.461	0.08	1.3	1.3
	0.976	6399	B09DQ2	16234	2.687	27.383	0.08	2.2	2.2
	2.603	16245	B09DQ6	14097	2.334	2133.42	2	4266.8	4300
	4.881	31043	B09DQ7	18827	3.117	286.177	0.08	22.9	23
	16.27	95758	B09DQ8	70410	11.656	1100.99	0.08	88.1	88
			B09DQ9	10652	1.763	162.258	0.08	13.0	13
			B09DR0	14903	2.467	223.559	0.08	17.9	18
			B09DR1	65553	10.852	108.807	0.08	8.7	8.7
			B09DR3	12124	2.007	186.936	0.08	15.0	15
			B09DR4	35249	5.835	537.372	0.08	43.0	43
			B09DR5	15270	2.528	238.981	0.08	19.1	19
			B09DR6	76579	12.677	131.376	0.08	10.5	11
			QC-LCS	10785	1.785	16.22	0.08	1.3	1.3
			QC-BLANK	-869	-0.144	0	0.08	0.0	0
			B09DQ0-DU	10585	1.752	17.726	0.08	1.4	1.4
Slope:	1.7E-04								

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071

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Uranium 233/4/5/8

Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	4	19	19	19	20	19	24	25
Sample count time	209.27	642.33	623.7	829.38	623.7	1027.23	623.7	642.33
GMT Count Time	27.1	27.3	28.3	25.093	28.3	31.9	28.3	27.3
Zero Time	337.7	340.7	341.8	343.733	347.8	347.7	348.7	348.9
Corr. tracer dpm	10.46	10.46	10.46	10.46	10.46	10.46	10.46	10.46
Bkgd count time	2560.02	2560.02	2560.02	2560.02	2560.02	2337.9	2560.02	2560.02
Net tracer counts	482	1315	1439	1988	1401	2476	1585	1762
Detector eff.	0.2605	0.2515	0.2546	0.2334	0.2717	0.2538	0.304	0.2942
Yield	0.8453	0.7782	0.8664	0.9818	0.7904	0.9079	0.7992	0.8914
Aliquot	1	1	1	0.01	1	1	1	1
U-238, gross counts	56	125	261	6276	2212	15156	1446	2331
U-238, bkgd counts	0	5	4	12	15	54	11	16
U-238 Lambda	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13
U-238 Decay Corr.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts	3	12	8	253	137	831	95	122
U-235, bkgd counts	1	3	2	178	4	340	5	4
U-235 Lambda	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12
U-235 Decay Corr.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts	62	133	245	6089	2273	14719	1498	2362
U-233/4, bkgd counts	3	10	9	19	20	74	21	24
U-233/4 Lambda	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08
U-233/4 Decay Corr.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-238, result calc.	0.547	0.430	0.841	1484.616	7.389	28.738	4.266	6.190
U-238, result rptd	0.550	0.430	0.840	1500.000	7.400	29.000	4.300	6.200
U-238 MDA calc.	0.075	0.037	0.031	3.83	0.06	0.07	0.05	0.05
U-238, MDA rptd.	0.070	0.040	0.040	4.000	0.070	0.070	0.050	0.060
U-235, result calc.	0.024	0.039	0.024	21.520	0.542	1.131	0.324	0.382
U-235, result rptd.	0.024	0.039	0.024	22.000	0.540	1.100	0.320	0.380
U-235, MDA calc.	0.091	0.035	0.030	17.839	0.038	0.198	0.038	0.030
U-235, MDA rptd.	0.090	0.040	0.030	40.000	0.040	0.600	0.040	0.040
U-233/4, result calc.	0.577	0.441	0.773	1438.636	7.577	27.869	4.391	6.252
U-233/4, result rptd.	0.580	0.440	0.770	1400.000	7.600	28.000	4.400	6.300
U-233/4, MDA calc.	0.079	0.053	0.046	4.814	0.070	0.076	0.063	0.061
U-233/4, MDA rptd.	0.090	0.060	0.050	5.000	0.080	0.080	0.070	0.060

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-072

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Uranium 233/4/5/8

Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP	QC-BLANK
Detector	26	4	25	4	19	20	24	25	21
Sample count time	642.33	623.7	623.7	331.02	331.02	331.02	331.02	331.02	1027.23
GMT Count Time	27.3	28.3	28.3	28.8	28.8	28.8	28.8	28.8	31.9
Zero Time	349.7	348.8	350.3	350.3	350.3	28.8	28.8	337.3	31.9
Corr. tracer dpm	10.46	10.46	10.46	10.46	10.46	10.46	10.46	10.46	10.46
Bkgd count time	2560.02	2560.02	2560.02	2560.02	2560.02	2560.02	2560.02	2560.02	2337.9
Net tracer counts	1578	1558	1605	751	848	851	812	873	1661
Detector eff.	0.314	0.2635	0.3005	0.2617	0.2537	0.272	0.3076	0.2947	0.2464
Yield	0.7480	0.9063	0.8187	0.8288	0.9654	0.9039	0.7625	0.8558	0.6275
Aliquot	1	1	1	1	1	1	1	1	1
U-238, gross counts	1120	1701	4692	1119	677	751	1	105	15
U-238, bkgd counts	7	12	32	5	4	44	1	1	3
U-238 Lambda	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13
U-238 Decay Corr.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts	53	107	297	53	31	436	1	7	7
U-235, bkgd counts	3	3	4	1	2	3	2	3	2
U-235 Lambda	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12
U-235 Decay Corr.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts	1071	1688	4564	1101	672	738	7	103	19
U-233/4, bkgd counts	12	18	43	9	7	51	5	5	13
U-233/4 Lambda	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08
U-233/4 Decay Corr.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-238, result calc.	3.32	5.11	13.68	6.99	3.74	3.91	0.00	0.56	0.034
U-238, result rptd	3.30	5.10	14	7	3.7	3.9	0	0.56	0.034
U-238 MDA calc.	0.04	0.05	0.08	0.07	0.05	0.17	0.04	0.04	0.02
U-238, MDA rptd.	0.04	0.06	0.1	0.08	0.07	0.2	0.04	0.04	0.03
U-235, result calc.	0.18	0.38	1.04	0.39	0.20	2.90	-0.01	0.026	0.017
U-235, result rptd.	0.18	0.38	1	0.39	0.2	2.9	-0.007	0.026	0.017
U-235, MDA calc.	0.029	0.030	0.033	0.058	0.052	0.05	0.05	0.05	0.03
U-235, MDA rptd.	0.03	0.04	0.04	0.06	0.05	0.06	0.07	0.06	0.03
U-233/4, result calc.	3.16	5.05	13.27	6.85	3.69	3.80	0.012	0.53	0.017
U-233/4, result rptd.	3.20	5.00	13	6.8	3.7	3.8	0.012	0.53	0.017
U-233/4, MDA calc.	0.048	0.060	0.090	0.088	0.069	0.18	0.06	0.06	0.05
U-233/4, MDA rptd.	0.05	0.07	0.08	0.1	0.08	0.2	0.07	0.07	0.05

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Plutonium 238/239

Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	51	65	32	3	33	4	34	66
Count time	922.97	1095.55	1077.6	710.27	1077.6	710.27	1077.6	1095.55
GMT, count:	41.12	27.99	28	26.3	28	26.3	28	27.99
Zero time:	337.7	340.7	341.8	343.7	347.8	347.7	348.7	348.9
Corr, tracer dpm	4.86	4.86	4.86	9.74	4.86	9.74	4.86	4.86
Bkgd, count time	2266.2	2576	2574.47	2560.02	2574.47	2560.02	2574.47	2576
Net, tracer counts	827	460	937	1364	677	869	612	692
Detector Eff	0.4096	0.4111	0.3317	0.2454	0.361	0.2474	0.3767	0.4118
Yield	0.4501	0.2102	0.5394	0.8034	0.3581	0.5077	0.3102	0.3156
Pu239, gross counts	2	0	6	338	4	6	1	0
Pu239, bkgd counts	0	0	3	10	2	4	3	0
Pu-239, Lambda:	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08
Pu239 decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts	4	1	21	17	21	13	29	3
Pu238, bkgd counts	1	1	18	15	14	10	15	1
Pu-238, Lambda:	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05
Pu238 decay	0.9985	0.9989	0.9989	0.9990	0.9990	0.9990	0.9990	0.9990
Aliquot	1	1	1	1	1	1	1	1
Pu239, Result calc.	0.005	0.000	0.007	1.055	0.006	0.010	-0.007	0.000
Pu239, Result rptd	0.005	0.000	0.007	1.100	0.006	0.010	-0.007	0.000
Pu239, MDA calc.	0.020	0.037	0.019	0.047	0.025	0.047	0.029	0.024
Pu239, MDA rptd.	0.020	0.040	0.030	0.050	0.030	0.050	0.040	0.020
Pu238, Result calc.	0.008	0.000	0.007	0.006	0.023	0.015	0.050	0.006
Pu238, Result rptd.	0.008	0.000	0.007	0.006	0.023	0.015	0.050	0.006
Pu238, MDA calc.	0.020	0.037	0.046	0.058	0.056	0.074	0.065	0.024
Pu238, MDA rptd	0.020	0.040	0.050	0.050	0.070	0.070	0.08	0.02

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Plutonium 238/239

Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP
Detector	30	31	52	53	51	57	58	60
Count time	1077.6	1077.6	1056.13	1056.13	1007.02	1056.13	1056.13	1056.13
GMT, count:	28	28	29	29.1	36.3	29.1	29.1	29.1
Zero time:	349.7	348.8	350.3	350.3	350.3	29.1	29.1	337.3
Corr, tracer dpm	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Bkgd, count time	2574.47	2574.47	2576	2576	1025.18	2576	2576	2576
Net, tracer counts	899	598	776	428	408	510	652	779
Detector Eff	0.377	0.3373	0.3842	0.3885	0.4091	0.3562	0.3696	0.3725
Yield	0.4553	0.3385	0.3935	0.2146	0.2038	0.2789	0.3437	0.4074
Pu239, gross counts	2	7	2	2	0	204	3	2
Pu239, bkgd counts	3	3	0	2	3	0	1	0
Pu-239, Lambda:	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08	7.78E-08
Pu239 decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Pu238, gross counts	19	15	4	0	4	3	2	1
Pu238, bkgd counts	13	17	2	2	5	0	0	1
Pu-238, Lambda:	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05
Pu238 decay	0.9990	0.9990	0.9990	0.9990	0.9989	1.0000	1.0000	0.9988
Aliquot	1	1	1	1	1	1	1	1
Pu239, Result calc.	-0.002	0.015	0.006	0.000	-0.016	0.876	0.007	0.006
Pu239, Result rptd	-0.002	0.015	0.006	0.000	-0.016	0.880	0.007	0.006
Pu239, MDA calc.	0.020	0.030	0.022	0.039	0.043	0.033	0.026	0.022
Pu239, MDA rptd.	0.030	0.040	0.020	0.050	0.060	0.030	0.030	0.020
Pu238, Result calc.	0.015	-0.007	0.006	-0.010	-0.005	0.013	0.007	0.000
Pu238, Result rptd.	0.015	-0.007	0.006	-0.010	-0.005	0.013	0.007	0.000
Pu238, MDA calc.	0.041	0.070	0.022	0.039	0.056	0.033	0.026	0.022
Pu238, MDA rptd	0.05	0.08	0.03	0.05	0.07	0.03	0.03	0.02

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075

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Americium/Curium

Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	60	61	65	47	66	48	61	62
Count Time	1022.32	1022.32	1022.05	792.27	1022.05	792.27	881.28	1022.32
GMT, count:	31.9	31.9	31.9	43.3	31.9	43.3	34	31.9
Zero time:	337.7	340.7	341.8	343.7	347.8	347.66	348.7	348.8
Tracer dpm	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95
Bkgd count time	2330.62	2330.62	2330.62	2268.63	2330.62	2268.63	2330.62	2330.62
Net tracer counts	1262	1508	1627	1357	1622	1143	1284	1549
Detector eff.	0.3725	0.4186	0.4111	0.394	0.4118	0.4074	0.4189	0.3837
Yield	0.6695	0.7119	0.7823	0.8782	0.7786	0.7154	0.7026	0.7978
Aliquot	1	1	1	1	1	1	1	1
Am241 gross counts	4	6	4	684	13	108	4	2
Am241 bkgd. counts	3	3	5	9	4	7	2	4
Am241 Lambda	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06
Am241 decay	0.9998	0.9998	0.9998	0.9997	0.9998	0.9998	0.9998	0.9998
Cm244 gross counts	1	2	3	10	7	13	10	2
Cm244 bkgd counts	2	2	2	8	2	8	2	1
Cm244 Lambda	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Cm244 decay	0.9937	0.9941	0.9942	0.9932	0.9948	0.9936	0.9947	0.9949
Am241 result calc.	0.002	0.004	-0.001	1.109	0.012	0.197	0.003	-0.003
Am241 result rptd.	0.002	0.004	-0.001	1.100	0.012	0.200	0.003	-0.003
Am241 MDA calc.	0.014	0.012	0.014	0.023	0.013	0.024	0.013	0.013
Am241 MDA rptd	0.010	0.010	0.010	0.030	0.010	0.030	0.010	0.010
Cm244 result calc.	-0.002	0.000	0.001	0.003	0.007	0.010	0.014	0.001
Cm244 result rptd	-0.002	0.000	0.001	0.003	0.007	0.010	0.014	0.001
Cm244 MDA calc.	0.014	0.011	0.011	0.022	0.011	0.026	0.013	0.011
Cm244 MDA rptd.	0.010	0.010	0.010	0.030	0.010	0.030	0.01	0.01

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-076

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Americium/Curium

Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP	QC-BLANK
Detector	63	64	62	63	64	65	66	34	66
Count Time	1022.32	1022.32	881.28	881.28	881.28	881.28	881.28	848.77	797.85
GMT, count:	31.9	31.9	34	34	34	34	34	34	43.3
Zero time:	349.7	348.8	350.3	350.3	350.3	34	34	337.3	43.3
Tracer dpm	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95
Bkgd count time	2330.62	2330.62	2330.62	2330.62	2330.62	2330.62	2330.62	2329.1	2266.2
Net tracer counts	1546	1273	1348	1022	1402	1656	1381	1115	1286
Detector eff.	0.3946	0.4077	0.406	0.3893	0.4224	0.4254	0.4084	0.4054	0.4099
Yield	0.7742	0.6170	0.7611	0.6018	0.7609	0.8924	0.7752	0.6546	0.7944
Aliquot	1	1	1	1	1	1	1	1	1
Am241 gross counts	2	5	4	6	4	680	6	11	15
Am241 bkgd. counts	4	5	3	3	6	5	4	13	3
Am241 Lambda	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06	4.03E-06
Am241 decay	0.9998	0.9998	0.9998	0.9998	0.9998	1.0000	1.0000	0.9998	1.0000
Cm244 gross counts	5	3	7	0	1	457	1	18	4
Cm244 bkgd counts	1	2	1	1	2	2	2	14	1
Cm244 Lambda	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Cm244 decay	0.9950	0.9949	0.9949	0.9949	0.9949	1.0000	1.0000	0.9935	1.0000
Am241 result calc.	-0.003	0.000	0.002	0.007	-0.003	0.909	0.003	-0.004	0.021
Am241 result rptd.	-0.003	0.000	0.002	0.007	-0.003	0.910	0.003	-0.004	0.021
Am241 MDA calc.	0.013	0.018	0.013	0.018	0.018	0.014	0.015	0.034	0.014
Am241 MDA rptd	0.010	0.020	0.010	0.020	0.020	0.010	0.010	0.040	0.010
Cm244 result calc.	0.006	0.002	0.010	-0.002	-0.002	0.613	-0.002	0.008	0.005
Cm244 result rptd	0.006	0.002	0.010	-0.002	-0.002	0.610	-0.002	0.008	0.005
Cm244 MDA calc.	0.011	0.014	0.013	0.017	0.012	0.010	0.012	0.035	0.013
Cm244 MDA rptd.	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.04	0.01

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Neptunium								
Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	46	62	29	43	36	36	37	39
Np239 cpm	17.6	20.77	30.77	33.63	41.56	29.88	41.38	21.54
Inst. eff.	0.721	0.721	0.721	0.721	0.721	0.721	0.721	0.721
Am243 added	99.08	99.08	99.08	99.08	99.08	99.08	99.08	99.08
Yield	0.2464	0.2908	0.4307	0.4707	0.5817	0.4183	0.5792	0.3015
Aliquot	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Count time	1002.87	996.68	1044.22	1005.7	1044.22	986.25	1044.22	1008.88
Np237 gross counts	4	4	3	814	18	20	14	1
Np237 bkgd counts	0	1	2	1	8	8	4	0
Np237 aspec. eff	0.377	0.395	0.391	0.374	0.374	0.374	0.424	0.408
Np237 result calc.	0.019	0.012	0.003	2.068	0.020	0.035	0.018	0.004
Np237 result rptd.	0.019	0.012	0.003	2.100	0.020	0.035	0.018	0.004
Np237 MDA calc.	0.037	0.030	0.020	0.020	0.026	0.038	0.016	0.028
Np237 MDA rptd.	0.010	0.030	0.020	0.020	0.030	0.050	0.02	0.01

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Neptunium										
Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP	QC-LCS	QC-BLANK
Detector	40	28	36	37	38	38	41	39	66	39
Np239 cpm	11.43	30.23	22.49	25.69	18.46	41.11	24.17	24.42	31.31	20.98
Inst. eff.	0.721	0.721	0.721	0.721	0.721	0.721	0.721	0.721	0.721	0.721
Am243 added	99.08	99.08	99.08	99.08	99.08	99.08	99.08	99.08	99.08	99.08
Yield	0.1601	0.4232	0.3148	0.3596	0.2584	0.5755	0.3384	0.3418	0.4383	0.2937
Aliquot	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Count time	1008.8	1044.22	1077.6	1077.6	1077.6	1044.22	1008.88	1075.42	996.68	1008.88
Np237 gross counts	6	5	9	6	4	1463	7	1	1050	1
Np237 bkgd counts	0	1	8	5	3	2	7	0	2	0
Np237 aspec. eff	0.411	0.386	0.374	0.424	0.396	0.396	0.411	0.399	0.411	0.4
Np237 result calc.	0.041	0.011	0.004	0.003	0.004	2.765	0.000	0.003	2.629	0.004
Np237 result rptd.	0.041	0.011	0.004	0.003	0.004	2.800	0.000	0.003	2.600	0.005
Np237 MDA calc.	0.052	0.020	0.047	0.029	0.033	0.015	0.040	0.024	0.019	0.029
Np237 MDA rptd.	0.02	0.02	0.06	0.04	0.05	0.02	0.05	0.009	0.02	0.01

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Iodine-129								
Sample ID	B09DQ0	B09DQ1	B09DQ2	B09DQ6	B09DQ7	B09DQ8	B09DQ9	B09DR0
Detector	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14
Count Time	416.25	504.57	400.55	654.52	435.8	401.95	584.7	409.83
Gross cpm	0.548	0.499	0.567	0.579	0.519	0.883	0.635	0.532
Bkg cpm	0.664	0.52	0.655	0.679	0.739	0.83	0.756	0.389
Blank cpm	-0.141	-0.125	-0.125	-0.139	-0.141	-0.139	-0.141	-0.125
Net cpm	0.025	0.105	0.037	0.038	-0.079	0.192	0.020	0.267
Lambda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days	52.94	45.60	45.24	54.60	43.93	51.12	44.62	38.84
Decay	1	1	1	1	1	1	1	1
Yield	0.6762	0.5308	0.7409	0.705	0.6208	0.7694	0.6114	0.5246
Aliquot	1	1	1.02	1	1.02	1	1.01	1.02
PPT. Corr.	1	1	1	1	1	1	1	1
Product	6.76E-01	5.31E-01	7.56E-01	7.05E-01	6.33E-01	7.69E-01	6.18E-01	5.35E-01
P-factor	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57
Result Calc.	0.076	0.407	0.101	0.111	-0.257	0.514	0.067	1.027
Result Rptd.	0.076	0.410	0.100	0.110	-0.260	0.510	0.068	1.000
MDA Calc.	0.567	0.580	0.513	0.438	0.624	0.567	0.559	0.552
MDA Rptd.	2.000	2.000	2.000	1.000	2.000	2.000	2.000	2.000

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09DQ6-TMA-681

Iodine-129

Sample ID	B09DR1	B09DR3	B09DR4	B09DR5	B09DR6	QC-LCS	QC-BLANK	B09DQ0-DUP
Detector	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14	XSPEC14
Count Time	681.62	428.07	448.08	400.77	583.42	630.62	398.98	334.87
Gross cpm	0.622	0.561	0.605	0.492	0.571	12.486	0.546	0.484
Bkg cpm	0.74	0.619	0.572	0.633	0.625	0.71	0.536	0.409
Blank cpm	-0.125	-0.125	-0.141	-0.141	-0.141	-0.141	-0.141	-0.139
Net cpm	0.007	0.066	0.174	0.001	0.087	11.918	0.152	0.214
Lambda	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days	35.52	37.97	4.34E+01	43.71	43.99	0.00	0.00	60.76
Decay	1	1	1	1	1	1	1	1
Yield	0.6525	0.7283	0.6049	0.6143	0.5696	0.6431	0.6804	0.7374
Aliquot	1.02	1	1	1.03	1.02	1	1	1
PPT. Corr.	1	1	1	1	1	1	1	1
Product	6.66E-01	7.28E-01	6.05E-01	6.33E-01	5.81E-01	6.43E-01	6.80E-01	7.37E-01
P-factor	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57
Result Calc.	0.022	0.187	0.592	0.003	0.308	38.149	0.460	0.597
Result Rptd.	0.021	0.190	0.590	0.000	0.310	38.000	0.460	0.600
MDA Calc.	0.475	0.501	0.567	0.603	0.540	0.501	0.517	0.455
MDA Rptd.	2.000	2.000	2.000	2.000	2.000	2.000	2.000	1.000

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