START 9713505.2040

B09904-TMA-644 TMA

0045809

RECORD COPY

JAN 1994
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SOLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

ORGANICS & GENERAL CHEMISTRY
Case No. 11-043
(TMA/ARLI Work Order No. A3-11-043)

METALS & NITRATE/NITRITE
Case N3-11-063
(TMA/Skinner & Sherman W.O. Nos. S3-11-125 & S3-11-126)

January 13, 1994

NOV 1996
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EDMC

TMA Master Work Order N3-11-063

i 7/10/96

9713505.2041

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PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # W3-11-063

RCVD: 11/10/93 DUE: 12/15/93 11/10/93 13:04:45 KEEP: 12/15/94 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY			
01A-S	B09DP0	ARLI	WH014	WH016	WH195	WH232
01C-S	B09DP0 MS	ARLI	WH014	WH016	WH195	WH232
01D-S	B09DP0 MSD	ARLI	WH014	WH016	WH195	
01E-S	B09DP0 DUP	ARLI	WH232			

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	11-10-93	ARLI	11-10-93	C. Harris	11/11/93

9713505.2042

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Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), 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
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1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), 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

JGR 11-5-93

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
JG Hogan	W.U. Setzer	11-9-93 1115
W.U. Setzer	H. Narcuso	11-10-93 10:22

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713505.2043

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Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS / J.G. HOGAN S.A.F. # 93-263 Date 11-5-93

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

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09DP0	S	11-5-93	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 [illegible] (RC-306, RC-303, RC-309, RC-304) 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) [illegible] 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
			KER 11-5-93	
				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

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SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARLI

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D. WHITAKER

LOG-IN-DATE : 11-1-93

RECEIVED BY (SIGNATURE): D. Whitaker

ICE CHEST NO. 7359155263

REMARKS:		CORRESPONDING EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
1. Custody Seal(s)	Present / Absent* Intact / Broken		B090P0	A311043	
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.:	7359155263				
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:	11-1-93				
12. Temp of ice chest	3 °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

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FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289155263

7289155263

RECIPIENT'S COPY

1 Date 11-10-93

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (310-235-2633

Company: T M A /NORCAL

Department/Floor No.:

Street Address: 1030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

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

Recipient's Phone Number (Very Important): (818) 357-2247

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.): 2240-66406

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 (Postmark 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, 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 (Type right)
1		
Total 1	Total 34	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

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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9713505.2046

TMA/AAU
Thermo Analytical Inc.

000005

RADIATION DOSE RATE SURVEY FORM

7289155263

Date 11/11/93 COMPANY ~~OAKRIDGE~~ WHC ~~TMA/LEBERLINE~~ OTHER ORD # ~~9909024403~~

Surveyor's Name MARK S. McGray

Model No. HP-210 / ESP-1 Model No. AC-2-7 / ESP-1

Serial No. 110289 / 07619 Serial No. 407726 / 07628

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 Rads	HP-210 DPM	AC-2-7 CPM	AC-2-7 Rads	AC-2-7 DPM	Source of Enrichment	Activity pCi/g or pCi/L
Background		27.0			2.0		-		
Consumer		7,380	0.2849		4,094	0.1505			
Source SML 55A		47.0			4.0			None	
Reported WHC (1) sample; TOTAL ACTIVITY = <50 pCi/gram.									

Comments

All OK ✓ Approved MSM

Not OK Date 11/11/93

GENERAL CHEMISTRY RESULTS

CASE NO. 11-043

Soil Sample #

B09DP0

CASE NARRATIVE

Sample B09DP0 (A3-11-043-01G, 01I Dup) did not exhibit homogeneity. Therefore, the Relative Percent Difference for Chloride was 33.3% and 30.3% for Sulfate. The sample, duplicate, and matrix spike was reanalyzed within holding time. The second analysis also exhibited the same inhomogeneity. The second analysis has been included only to demonstrate the matrix effects on the analytes concentration.

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

Maureen Parrish 1/12/94

Maureen Parrish

9713505.2048

000009

TMA Inc. REPORT Work Order # A3-11-043

Received: 11/10/93

Results by Sample

SAMPLE ID B09DP0 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 11/05/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	9.5	mg/kg	2.0
Fluoride	300.0	1.9	mg/kg	1.0
Sulfate	300.0	14	mg/kg	10

FORM I

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 11-043

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : November 10, 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 in the Kerosene Range (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP0	A3-11-043-01A	V	SOIL
B09DP0 MS	A3-11-043-01B	V	SOIL
B09DP0 MSD	A3-11-043-01C	V	SOIL
B09DP0	A3-11-043-01D	SV	SOIL
B09DP0 MS	A3-11-043-01E	SV	SOIL
B09DP0 MSD	A3-11-043-01F	SV	SOIL
B09DP0	A3-11-043-01J	K	SOIL
B09DP0 MS	A3-11-043-01K	K	SOIL
B09DP0 MSD	A3-11-043-01L	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 :

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.

Di-n-butylphthalate was detected in all of the samples and the blank at concentrations that were below the CRQL. The compound bis(2-Ethylhexyl)phthalate was also found in the sample B09DP0 and B09DP0MS at concentrations less than the CRQL.

In sample B09DP0MS, 4-Nitrophenol was detected at a concentration that exceeded the calibration range, and was therefore "E" qualified. In addition, the matrix spike recovery of 4-Nitrophenol in sample B09DP0MS was above the advisory QC limit. In accordance with CLP 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 approximately 200ppm to 2000ppm. The continuing calibration at the 1000ppm level 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 for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20g of the sample was extracted and concentrated to 5 mL.

There were no hydrocarbons detected in any of the samples. Sample B09DP0 was spiked with Kerosene and the matrix spike

recoveries were 55% for both the MS and the MSD. A blank spike was prepared at the same time, and had a 73% recovery.

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

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 designee, as verified by the following signatures.

Maureen Parrish 1/12/94
Maureen Parrish
Project Manager

9713505.2052

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31116R03

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: not dec. 4 Date Analyzed: 11/16/93

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	3	BJ
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	2	J
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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000085
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31116R03

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: not dec. 4 Date Analyzed: 11/16/93

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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000086

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 31202S08

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	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

9713505.2055

000087
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 31202S08

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	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	65	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	39	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

9713505.2056

000088
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 31202S08

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	6.87	5700	J
2.	UNKNOWN HYDROCARBON	7.17	380	BJ
3.	UNKNOWN HYDROCARBON	8.17	830	BJ
4.	UNKNOWN ALCOHOL	8.53	760	BJ
5.	UNKNOWN HYDROCARBON	10.95	140	J
6.	UNKNOWN HYDROCARBON	11.75	790	BJ
7.	UNKNOWN CARBOXYLIC ACID ESTE	20.73	1000	BJ
8.	HEXANEDIOIC ACID ESTER	25.63	240	BJ
9.	UNKNOWN ALKANE	28.37	100	J
10.	UNKNOWN ALKANE	30.87	340	J

TMA Inc. REPORT Work Order # A3-11-043

Received: 11/10/93

Results by Sample

SAMPLE ID B09DP0 FRACTION 01J TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 11/05/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 12/01/93
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

9713505.2058

 Skinner&Sherman REPORT Work Order # S3-11-126

Received: 11/11/93 12/22/93 14:53:05

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 2
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

WORK ID N3-11-063
TAKEN By client
TRANS Fedex
TYPE Soil
P.O. # N3-11-063
INVOICE under separate cover

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 B09DP0	NITR S Nitrate/Nitrite in Soils
01 B09DP0D	
01 B09DP0S	
02 LCSS	

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 shred 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

9713505.2059

 Skinner&Sherman REPORT Work Order # S3-11-126

Received: 11/11/93 Results by Sample

SAMPLE ID B09DP0 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/05/93 Category SOIL

NITR_S 11.4
mg N/kg

SAMPLE ID B09DP0D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 11/05/93 Category SOIL

NITR_S 7.79
mg N/kg

SAMPLE ID B09DP0S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 11/05/93 Category SOIL

NITR_S 25.4
mg N/kg

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

NITR_S 2.06
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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1-800-4 LAB TEST FAX (617) 890-3883

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
S311126-01	11.4 mg/kg	19.8 mg/kg	25.4 mg/kg	70.7

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S311126-01	11.4 mg/kg	7.79 mg/kg	37.6

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.06 mg/L	103.0
Prep blank	--	<0.25 mg/L	--

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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9713505.2061

Received: 11/11/93

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

9713505.2062

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-11-1266 Client Hanford NOC Number/Type of Samples 1
Protocol CLP Turnaround 33 Cooler Temp: _____ °C, or N/A Cooler Yes/No
Custodian: D. Martineau Shipper & # Fedex SDG/Batch# NA
Custody Seal: Present/Absent/Intact/Not Client Case# N3-11-063
Purchase Order/Contract# N3-11-063 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: 11/11/93 _____ _____ _____ _____ _____
List any date with paperwork/shipment problems & specify the problem:

NA

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09DPX	Soil	11/11/93	NA	NO_3/NO_2 DS	
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

complete

RRM 11/93

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

023

9713505.2063

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N3-11-063

RCVD: 11/10/93 DUE: 12/15/93 11/10/93 13:04:57 KEEP: 12/15/94 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY					
01B-S	B09DP0	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01F-S	B09DP0 MS	S&S	WH001	WH002	WH004	WH005	WH233	WH390
01G-S	B09DP0 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
[illegible]	11-10-93	S&S	11-10-93	[illegible]	~~11/10/93~~ 11/11/93

024

9713505.2064

TMA

JAN 1994
RECEIVED
SOLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:
NITRATE/NITRITE
Case No. N3-11-060
(TMA/Skinner & Sherman W.O. No. S3-11-106)

January 10, 1994

TMA Master Work Order N3-11-060

i SW 7/10/96

9713505.2065

TMA

Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

QUALITY ENVIRONMENTAL SERVICES

Report for

TMA/Norcal

WORK ORDER #S311106

Scientific Services Since 1922

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

ia 7-10-96 80

9713505.2066

 Skinner&Sherman REPORT Work Order # S3-11-106

Received: 11/09/93 12/22/93 15:05:20

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

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 6
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 N3-11-060
TAKEN By Client
TRANS Fedex
TYPE Soil NO3NO2
P.O. # N3-11-060
INVOICE under separate cover

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 B09904	NITR S Nitrate/Nitrite in Soils
01 B09904 Dup.	
01 B09904 Spike	
02 B09905	
03 B09906	
04 B09907	
05 B09908	
06 Soil LCS	

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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
1-800-4 LAB TEST FAX (617) 890-3883

9713505.2067

 Skinner&Sherman REPORT Work Order # S3-11-106

Received: 11/09/93

Results by Sample

SAMPLE ID B09904 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 10/29/93 Category SOIL

NITR_S 68.7
mg N/kg

SAMPLE ID B09904 Dup. SAMPLE # 01 FRACTIONS: B
Date & Time Collected 10/29/93 Category SOIL

NITR_S 65.9
mg N/kg

SAMPLE ID B09904 Spike SAMPLE # 01 FRACTIONS: C
Date & Time Collected 10/29/93 Category SOIL

NITR_S 88.0
mg N/kg

SAMPLE ID B09905 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 11/01/93 Category SOIL

NITR_S 106
mg N/kg

SAMPLE ID B09906 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 11/01/93 Category SOIL

NITR_S 197
mg N/kg

SAMPLE ID B09907 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 11/02/93 Category SOIL

NITR_S 15.3
mg N/kg

SAMPLE ID B09908 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 11/02/93 Category SOIL

NITR_S 12.1
mg N/kg

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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
1-800-4 LAB TEST FAX (617) 890-3883

Received: 11/09/93

Results by Sample

SAMPLE ID Soil LCS SAMPLE # 06 FRACTIONS: A

Date & Time Collected not specified Category SOIL LCS

NITR_S 2.04
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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1-800-4 LAB TEST FAX (617) 890-3883

9713505.2069

Received: 11/09/93 12/22/93 15:05:20

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
S311106-01	68.7 mg/kg	20.0 mg/kg	88.0 mg/kg	96.5

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S311106-01	68.7 mg/kg	65.9 mg/kg	4.2

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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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

9713505.2070

Received: 11/09/93

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
1-800-4 LAB TEST FAX (617) 890-3883

9713505.2071

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 53-11-106 Client Hanford-Nor Number/Type of Samples 5 soils
Protocol CLP Turnaround 33 day Cooler Temp: 4 °C or N/A Cooler Yes/No
Custodian: Benney, A. Shipper & # Fedex SDG/Batch# N/A
Custody Seal: Present/Absent/Intact/Not Client Case# N3-11-060
Purchase Order/Contract# N3-11-060 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: 11/10/93
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B09904	Soil	11/10/93	N/A	2,5 NO3NO2	
2	5					
3	6					
4	7					
5	8					
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

11/11/93

completed

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:

023

9313505.2072

TMA/Norcal

CHAIN OF CUSTODY

ORD # N3-11-060

RCVD: 11/09/93 DUE: 12/14/93 11/09/93 14:58:50 KEEP: 12/14/94 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY
01A-S	B09904	SMS	M-233
01B-S	B09904 MS	SMS	M-233
01C-S	B09904 DUP	SMS	M-233
01D-S	L C E	SMS	M-233
02A-S	B09905	SMS	M-233
03A-S	B09906	SMS	M-233
04A-S	B09907	SMS	M-233
05A-S	B09908	SMS	M-233

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Neil McCleate	11-9-93	Skinner	11-9-93	[illegible]	11/10/93

9713505.2073

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: 10-29-93

Ice Chest No.: SML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351

Offsite Property No.: WHH-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09904
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

024A

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

9213505.2074

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 10-29-93

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

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09904	S	10-29-93	1207	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			HER 10-29-93	
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

*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

024B

A-6000-406 (06/91) WEF060

9713505.2075

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: 11-1-93

Ice Chest No.: SML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351

Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE JER 11-8-93

Shipped to: TMA

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

Sample Identification

1) B09905

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)

1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~

~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

~~3)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~

~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

JER 11-1-93

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E. Rogers 11-8-93	K. Blum Hermit Blum	11-9-93 1145
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:

024C

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

9713505.2076

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 11-1-93

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

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09905	S	11-1-93	0850	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			JER 11-1-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

*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

024 D

A-6000-406 (06/91) WEF060

9713505.2077

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: 11-1-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: ~~HER 11-8-93~~ 2519010351 — Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09906

~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ HER 11-1-93
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E. Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

024E

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

9713505.2078

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 11-1-93

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

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09906	S	11-1-93	1345	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

*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

024F

A-6000-406 (06/91) WEF060

9713505.2079

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: 11-2-93

Ice Chest No.: SML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351 JER 11-8-93

Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09907
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B09908
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ JER 11-2-93
- ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
Loren E. Rogers 1045 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

024a

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

9713505.2080

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS S.A.F. # 93-263 Date 11-2-93

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

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09907	S	11-2-93	0942	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
B09908	S	11-2-93	1255	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C)~~ ~~U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

*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

024H

A-6000-406 (06/91) WEF060

TMA 9713505.2081
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

JAN 1994
RECEIVED
SDLA

January 4, 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 November 11, 1993 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals, titanium and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S311125.

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 and mercury exceeded the control limit requirements.

The laboratory duplicate for calcium exceeded the control limit requirement.

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

RECORD COPY

1 see 7/10/96

9713505.2082

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09DP0

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

Lab Code: SKINER Case No.: N3-11-063SAS No.: SDG No.: B09DP0

Matrix (soil/water): SOIL Lab Sample ID: 11125-01S

Level (low/med): LOW Date Received: 11/11/93

% Solids: 95.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6940			P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	4.5			P
7440-39-3	Barium	80.1			P
7440-41-7	Beryllium	0.29	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	14100		*	P
7440-47-3	Chromium	7.5			P
7440-48-4	Cobalt	9.6	B		P
7440-50-8	Copper	13.3			P
7439-89-6	Iron	18600			P
7439-92-1	Lead	4.3			P
7439-95-4	Magnesium	4530			P
7439-96-5	Manganese	316			P
7439-97-6	Mercury	0.05	U	N	CV
7440-02-0	Nickel	7.8			P
7440-09-7	Potassium	1270			P
7782-49-2	Selenium	0.54	U		P
7440-22-4	Silver	0.50	U		P
7440-23-5	Sodium	226	B		P
7440-28-0	Thallium	0.57	B		P
7440-62-2	Vanadium	46.3			P
7440-66-6	Zinc	40.7			P
	Cyanide	0.52	U		CA
7440-32-6	Titanium	1430			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

002

9713505.2083

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder S3-11-125 Client Hanford Nor Number/Type of Samples 1
Protocol CLP Turnaround 33 Cooler Temp: _____ °C, or N/A Cooler Yes/No
Custodian: D. Martineau Shipper & # Fedex SDG/Batch# NA
Custody Seal: Present/Absent/Intact/Not Client Case# N3-11-063
Purchase Order/Contract# N3-11-063 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: 11/11/93
List any date with paperwork/shipment problems & specify the problem:
NA

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B9DP9	Soil	11/11/93	NA	TM + Ti + CN O.S	
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

complete

DRM
11/11/93

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 _____

203

* EPA/CLP required

Rev 1.7

9713505.2084

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 7289155123

7289155123

RECIPIENT'S COPY

1 Date 11-10-93

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): (212-235-2333
Company:
Department/Floor No.:
Street Address:
City: [illegible] State: IA ZIP Required: 9 4 8 0 4

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 SOUTH 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**
* 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	TOTAL DECLARED VALUE (See right)
1		
Total 1	Total 28	Total

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: 11/11/93 FedEx Employee Number: 1000

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
© 1992-93 FEDEX PRINTED IN U.S.A.

9713505.2085

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

JAN 1994
RECEIVED
SDLA

January 21, 1994

Ref: TMA/Norcal N3-11-062-7296

Ms. Briana Colley
Westinghouse Hanford Company
345 Hills Street
Richland, WA 99352

Dear Ms. Colley:

Enclosed is the data report for the six soil samples received November 9 and 10, 1993 from location 200-UP-2. Results are given for gross alpha, gross beta, selenium-79, strontium-90, technetium-99, iodine-129, neptunium-237, total uranium, isotopic uranium, isotopic plutonium, americium-241, curium-244, and gamma scan analyses.

The data package is paginated 1 through 494.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

DPK/ss

Enclosure: Data Package

TMA/Norcal
Report N3-11-062-7296
Sample Delivery Group 7296

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

January 20, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7296 is comprised of the six soil samples from location 200-UP-2, delivered under Field Log Book #EFL-1091. Chain-of-Custody numbers were not provided.

One 1000 mL plastic bottle containing each sample was received for analysis. Inadequate volumes were received to meet gamma scan RDL's for the duplicate of sample BO9DP0.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

The relative percent difference (RPD) between sample BO9DP0 and its duplicate is slightly above the 3 σ contractual limit of 33%. The samples were recounted and the results did not improve. The sample inhomogeneity is suspected.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

Standardization solutions of selenium-79 are not available commercially for calibration of this analysis. LSC instrument efficiency must be determined using carbon-14, which has a decay scheme and beta energy spectrum very similar to those of selenium-79.

The analysis begins with the addition of stable selenium carrier to the sample and proceeds with appropriate separation and purification chemistry to isolate the selenium. The chemical recovery is gravimetrically determined by weighing the recovered carrier. The selenium is then prepared for LSC counting by combining it with a fluor in a scintillation vial. Instrument background is determined by preparing and counting a matched vial with carrier but no activity.

After the initial sample count, the vial is opened and spiked with a known amount of traceable carbon-14 activity and recounted. The counting efficiency is then determined from the combined data from both counts.

Since selenium-79 activity is not available and carbon-14 surrogate activity will not follow through the selenium purification chemistry, it is not possible to process a laboratory control sample. The QC samples will therefore consist of blanks and duplicates only.

TMA/Norcal
Report N3-11-062-7296
Sample Delivery Group 7296

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

January 20, 1994

2.0 ANALYSIS NOTES (con't.)

2.4 Strontium-90 Analyses
No problems were encountered by the laboratory in the analyses.

2.5 Technetium-99 Analyses
No problems were encountered by the laboratory in the analyses.

2.6 Iodine-129 Analyses
The recovery of iodine-129 in the laboratory control sample is 124% which is outside both the 3 σ protocol limits and the contractual limits of (80-120)%. No cause could be determined for the low recovery.

2.7 Neptunium-237 Analyses
Low recoveries were observed during the initial analysis and the sample was reanalyzed QC samples 7296-012 and 7296-013. The sample and the QC associated with the sample were counted for less than the nominal count time of 100 minutes. MDA's met the RDL despite the reduced count time.

2.8 Total Uranium Analyses
No problems were encountered by the laboratory in the analyses.

2.9 Isotopic Uranium Analyses
The count time for sample BO9DP0, the blank, and the laboratory control sample were less than the nominal count time of 150 minutes. The MDA's meet the RDL despite this.

2.10 Isotopic Plutonium Analyses
The plutonium-238 MDA in the duplicate of sample BO9DP0 is higher than the RDL due to higher detector background in the region of interest.

2.11 Americium-241/Curium-244 Analyses
No problems were encountered by the laboratory in the analyses.

2.12 Gamma Scan Analyses

The MDA's of several gamma nuclides for the duplicate analyses of sample B09DP0 are higher than the RDL's due to the smaller than nominal aliquot available for analysis. The MDA's of iron-59, cobalt-58, europium-152, 154, and 155 in the original of sample BO9DP0 are higher than the RDL's due to the shorter half-lives of the nuclides and, in some cases, due to higher background of the detector in the region of interest. The relative percent difference of cesium-137 in the sample and its duplicate is above the contractual limit of 33%. The sample inhomogeneity is suspected.

9713505.2089

N311062-01

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09904

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-01	Client sample id	B09904
Dept sample id	7296-001	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	10/29/93
% moisture	15.4	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	5.6	3.7	4	10	J	80A
Gross Beta	Beta	13	3.9	5	10		80B
Technetium 99	14133-76-7	0.36	0.16	0.4	0.5	U	TC
Uranium 233/234		1.1	0.19	0.08	0.3		U
Uranium 235	15117-96-1	0.067	0.045	0.06	0.3	J	U
Uranium 238		1.1	0.18	0.06	0.3		U
Total Uranium (ug/g)	7440-61-1	3.0	0.53	0.03	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

9713505.2090

N311062-02

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09905

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-02	Client sample id	B09905
Dept sample id	7296-002	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/01/93
% moisture	12.7	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	6.3	4.4	5	10	J	80A
Gross Beta	Beta	17	4.1	5	10		80B
Technetium 99	14133-76-7	0.59	0.16	0.4	0.5		TC
Uranium 233/234		0.53	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0	0.022	0.09	0.3	U	U
Uranium 238		0.50	0.14	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.4	0.25	0.03	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

9713505.2091

N311062-03

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09906

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-03	Client sample id	B09906
Dept sample id	7296-003	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/01/93
% moisture	18.3	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	9.8	4.3	4	10	J	80A
Gross Beta	Beta	28	4.6	5	10		80B
Technetium 99	14133-76-7	1.0	0.20	0.4	0.5		TC
Uranium 233/234		0.79	0.12	0.05	0.3		U
Uranium 235	15117-96-1	0.057	0.035	0.03	0.3	J	U
Uranium 238		0.76	0.12	0.03	0.3		U
Total Uranium (ug/g)	7440-61-1	2.9	0.51	0.03	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

9713505.2092

N311062-04

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09907

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-04	Client sample id	B09907
Dept sample id	7296-004	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/02/93
% moisture	14.4	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	8.5	4.0	4	10	J	80A
Gross Beta	Beta	19	4.2	5	10		80B
Technetium 99	14133-76-7	0.11	0.091	0.3	0.5	U	TC
Uranium 233/234		0.57	0.16	0.09	0.3		U
Uranium 235	15117-96-1	0.023	0.046	0.09	0.3	U	U
Uranium 238		0.58	0.16	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.7	0.29	0.03	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

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N311062-05

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09908

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-05	Client sample id	B09908
Dept sample id	7296-005	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/02/93
% moisture	16.3	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	6.8	3.4	3	10	J	80A
Gross Beta	Beta	19	4.3	5	10		80B
Technetium 99	14133-76-7	0.099	0.13	0.3	0.5	U	TC
Uranium 233/234		0.39	0.14	0.1	0.3		U
Uranium 235	15117-96-1	0.014	0.027	0.1	0.3	U	U
Uranium 238		0.40	0.14	0.09	0.3		U
Total Uranium (ug/g)	7440-61-1	1.2	0.21	0.03	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

9713505.2094

N311062-06

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09DP0

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-06	Client sample id	B09DP0
Dept sample id	7296-006	Location/Matrix	200-UP-2 SOLID
Received	11/10/93	Collected	11/05/93
% moisture	3.9	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	9.0	5.5	4	10	J	80A
Gross Beta	Beta	360	13	6	10		80B
Selenium 79	15758-45-9	0.028	0.96	2	10	U	SE
Strontium 90	10098-97-2	42	1.6	0.8	1		Y
Technetium 99	14133-76-7	0.18	0.14	0.4	0.5	U	TC
Iodine 129	15046-84-1	0.078	0.56	1	2	U	I
Uranium 233/234		0.69	0.18	0.08	0.3		U
Uranium 235	15117-96-1	0.038	0.050	0.1	0.3	U	U
Uranium 238		0.64	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	2.0	0.35	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.007	0.010	0	0.2	J	NP
Plutonium 238	13981-16-3	-0.006	0.016	0.04	0.05	U	PU
Plutonium 239/240		0.008	0.012	0.02	0.05	U	PU
Americium 241	14596-10-2	-0.007	0.014	0.05	0.05	U	TP
Curium 244	13981-15-2	0	0.014	0.05	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	12	0.83				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.06	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.04	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.5		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.5		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	320	1.0		0.05		GAM

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 01/20/94

TMA NORCAL
REPORTING GROUP 7296

N311062-06

DATA SHEET, cont

B09DP0

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-06	Client sample id	B09DP0
Dept sample id	7296-006	Location/Matrix	200-UP-2 SOLID
Received	11/10/93	Collected	11/05/93
% moisture	3.9	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		0.6	0.1	U	GAM
Europium 154	15585-10-1	U		0.4	0.1	U	GAM
Europium 155	14391-16-3	U		0.8	0.1	U	GAM
Radium 226	13982-63-3	0.69	0.25				GAM
Radium 228	15262-20-1	0.75	0.18				GAM
Thorium 228	14274-82-9	1.0	0.32				GAM
Thorium 232	7440-29-1	0.75	0.18				GAM

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

Westinghouse Hanford Company
Hanford Analytical Services Management

Commercial FAX #'s 372-1616 and 372-1546

Company Name: TMA

Contact Name: Deloras Sanchez

FAX Number: (510) 235-0438 | **Telephone Number:**

Sender: Sara Lindberg

Comments: Rad Form Package N3-11-062-7296 (Hazm B09904-TMA-644)

I can not find a "Standard Solution Certificate" for Neptunium-237 in App. 19. Is this available?

Jim

Jim

See attached memo, pls.

Thanx

Number of Pages (Including Coversheet): 1

Date Sent: 2/23/94 11:39 am

If there are any problems with this transmission, please call sending party on (509) 373-4718.

MEMORANDUM

To: Jim Rouse

From: Dolores Sanchez

Subject: Package N3-11-062-7296 (HASM B09904-TMA-644)

Date: February 24, 1994

==========

The Np^{237} solution used for the LCS samples is based on an internal calibration and does not have a certificate. Because the internal calibration was poorly documented, we have initiated a cross calibration of the solution against an NIST-traceable solution and will be able to provide this documentation by Wednesday, March 9.

9713505.2098

VALIDATION SUMMARY

9713505.2099

MEMORANDUM

MAR 1994
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TQD

TO: 200-UP-2 Project QA Record March 22, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09904-TMA-644 (923-E418 TMA644M.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09904-TMA-644 prepared by the Thermo Analytical 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
B09DP0	11/05/93	SOIL	SEE NOTE 1

Notes:

1. The sample was analyzed for CLP target analyte list (TAL) metals, cyanide and titanium.

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

Precision. Goals for precision were met with the exception of the deficiencies identified below.

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.

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2 1994
VALIDATION DOCUMENTATION
SDLA

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 one sample was validated in this data package with a total of 25 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal workplan objectives of 90 percent.

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.

Holding Time

- The holding time for cyanide was exceeded. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

Laboratory Blanks

- **Negative Blanks.** Thallium was detected at a negative concentration in the initial calibration blank. Attachments 2 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

Spike Sample Recovery

- Spike sample recovery was unacceptable for antimony. Attachment 2 provides a summary of the samples and data qualifications applied.

Duplicate Analysis

- The duplicate relative percent difference for calcium was unacceptable. Attachments 2 and 5 provide a summary of the samples and data qualifications applied.

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.

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.

9713505.2104

Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG: B0994	VALIDATOR: CJensen	DATE: 3/17/94	PAGE 1 OF 1
COMMENTS: Metals pkg B0994-TMA-644			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Cyanide	~~UJ~~ UJ	B09DP0	holding time
thallium	BJ	↓	IIB neg. blank
antimony	UJ	↓	SSR < 75%
Calcium	J	B09DP0	dup RPD >35

9713505.2106

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09DP0	
	Date	11-5-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
ALUMINUM	MG/KG	6940.000	
ANTIMONY	MG/KG	2.500	UJ
ARSENIC	MG/KG	4.500	
BARIUM	MG/KG	80.100	
BERYLLIUM	MG/KG	0.290	B
CADMIUM	MG/KG	0.250	U
CALCIUM	MG/KG	14100.000	J
CHROMIUM	MG/KG	7.500	
COBALT	MG/KG	9.600	B
COPPER	MG/KG	13.300	
IRON	MG/KG	18600.000	
LEAD	MG/KG	4.300	
MAGNESIUM	MG/KG	4530.000	
MANGANESE	MG/KG	316.000	
MERCURY	MG/KG	0.050	U
NICKEL	MG/KG	7.800	
POTASSIUM	MG/KG	1270.000	
SELENIUM	MG/KG	0.540	U
SILVER	MG/KG	0.500	U
SODIUM	MG/KG	226.000	B
THALLIUM	MG/KG	0.570	BJ
VANADIUM	MG/KG	46.300	
ZINC	MG/KG	40.700	
CYANIDE	MG/KG	0.520	UJ
TITANIUM	MG/KG	1430.000	

Verified
5/17/94

9713505.2107

9713505.2108

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809DP0

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

Lab Code: SKINER Case No.: N3-11-063SAS No.: SDG No.: 809DP0

Matrix (soil/water): SOIL Lab Sample ID: 11125-01S

Level (low/med): LOW Date Received: 11/11/93

% Solids: 95.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6940			P	
7440-36-0	Antimony	2.5	~~U~~	N	P	UJ
7440-38-2	Arsenic	4.5			P	
7440-39-3	Barium	80.1			P	
7440-41-7	Beryllium	0.29	B		P	
7440-43-9	Cadmium	0.25	U		P	
7440-70-2	Calcium	14100	~~J~~	*	P	J
7440-47-3	Chromium	7.5			P	
7440-48-4	Cobalt	9.6	B		P	
7440-50-8	Copper	13.3			P	
7439-89-6	Iron	18600			P	
7439-92-1	Lead	4.3			P	
7439-95-4	Magnesium	4530			P	
7439-96-5	Manganese	316			P	
7439-97-6	Mercury	0.05	~~U~~	N	CV	UL cj 3/22/94
7440-02-0	Nickel	7.8			P	
7440-09-7	Potassium	1270			P	
7782-49-2	Selenium	0.54	U		P	
7440-22-4	Silver	0.50	U		P	
7440-23-5	Sodium	226	B		P	
7440-28-0	Thallium	0.57	~~B~~		P	BJ
7440-62-2	Vanadium	46.3			P	
7440-66-6	Zinc	40.7			P	
	Cyanide	0.52	~~U~~		CA	UR UJ
7440-32-6	Titanium	1430			P	cj 3/17/94

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

~~002~~

010

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

TMA 9713505.2110
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

JAN 1994
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SDLA

January 4, 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 November 11, 1993 from TMA/Norcal. The sample was analyzed for the USEPA CLP Target Analyte List metals, titanium and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S311125.

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 and mercury exceeded the control limit requirements.

The laboratory duplicate for calcium exceeded the control limit requirement.

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

RECORD COPY

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~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), 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

SER 11-5-93

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

Relinquished by:	Received by:	Date/Time:
JG Hogan	W.U. Setzer W.U. SETZER	11-9-93 1115
W.U. Setzer	H. Narciso / H. NARCISO	11-10-93 10:22

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713505.2112

Attachment 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200 UP2		DATA PACKAGE: 109904-TMA-644
VALIDATOR: O Jensen	LAB: TMA	DATE: 3/17/94
CASE:		SDG:

ANALYSES PERFORMED

☒ CLP/ICP	~~☒ CLP/GFAA~~	☒ CLP/Hg	☒ CLP/Cyanide	~~☐ CN~~	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Soil / B29DF0

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: verification performed by WHC

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes (No) N/A

Comments:

The cyanide analysis was performed ~~54~~ 28 days after sample collection, result for sample B29DF0 qualified as NJ per WHC procedures. cj 3/17/94

cj 3/17/94

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:

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: Sb qualified due to MS <75%. Hg acceptable because result was <TDL. Ti acceptable because sample result is >4X spike result.

-016

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: Information not available to determine if sample was a QC sample. Requested info will be evaluated in final validation summary.

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: Sample was run ICP instead of furnace.

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

SDG:	VALIDATOR: C Jensen	DATE: 3/17/94	PAGE 1 OF 1
COMMENTS: Metals pkg. B09904-TMA-644			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DP0	ICP	11/5/93		12/16/93		41	none
	CN/Hg			12/3/94		28	none
	CN/Cd			12/3/94		28	~~J 3/17/94~~ UJ
	~~ICP AS, Tl, Pb, Se~~			1/3/94		59	none

BLANK AND SAMPLE DATA SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 3/17/94	PAGE 1 OF 1
COMMENTS: Metals pkg. 609904-THA-644			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	Thallium	-1.9906	B		ug/L	2x = 39	ug/L or [illegible]	[illegible] 609900	BJ

9713505.2118

WESTINGHOUSE/HANFORD

3
BLANKS

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

Lab Code: SKINER Case No.: N3-11-063SAS No.: SDG No.: B09DP0

Preparation Blank Matrix (soil/water): SOIL

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	10.6	U	11.5	B	10.6	U	10.6	U	4.098	B	P
Antimony	12.9	U	12.9	U	12.9	U	12.9	U	2.580	U	P
Arsenic	2.4	B	2.1	U	2.1	U	2.1	U	0.420	U	P
Barium	1.2	U	1.2	U	1.2	U	1.2	U	0.240	U	P
Beryllium	0.2	U	0.2	U	0.2	U	0.2	U	0.040	U	P
Cadmium	1.3	U	1.3	U	1.3	U	1.3	U	0.260	U	P
Calcium	59.0	U	59.0	U	59.0	U	59.0	U	11.800	U	P
Chromium	2.1	U	2.1	U	-3.0	B	2.1	U	0.672	B	P
Cobalt	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Copper	12.6	B	7.2	B	2.5	U	3.0	B	0.500	U	P
Iron	5.3	U	5.3	U	23.6	B	14.3	B	7.582	B	P
Lead	2.9	U	2.9	U	2.9	U	2.9	U	0.580	U	P
Magnesium	22.9	U	22.9	U	-36.3	B	22.9	U	4.580	U	P
Manganese	0.8	U	0.8	U	1.0	B	0.8	U	0.260	B	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.050	U	CV
Nickel	3.4	U	3.4	U	3.4	U	3.4	U	0.680	U	P
Potassium	68.5	U	68.5	U	68.5	U	68.5	U	13.700	U	P
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	0.560	U	P
Silver	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Sodium	114.4	U	114.4	U	114.4	U	114.4	U	22.880	U	P
Thallium*	-2.0	B	-2.4	B	-1.8	B	-1.9	B	-0.422	B	P
Vanadium	5.5	U	5.5	U	5.5	U	5.5	U	1.100	U	P
Zinc	5.4	B	4.4	U	4.4	U	4.4	U	0.880	U	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	0.500	U	CA
Titanium	-1.3	B	1.1	U	-2.2	B	1.1	U	0.220	U	P

B09DP0

Thallium result qualified ~~B~~ due to negative IC's.

~~008~~
021

3/17/94

FORM III - IN

~~ILM02.1~~

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WESTINGHOUSE/HANFORD

SA

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER:

B09DP0S

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

Lab Code: SKINER Case No.: N3-11-063SAS No.: SDG No.: B09DP0

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 95.4

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	58.3755		2.4811	U	102.77	56.8	N	P
Arsenic	75-125	379.4755		4.4700		411.07	91.2		P
Barium	75-125	485.8799		80.1396		411.07	98.7		P
Beryllium	75-125	9.9293		0.2885	B	10.28	93.8		P
Cadmium	75-125	9.5552		0.2500	U	10.28	92.9		P
Calcium									NR
Chromium	75-125	47.5172		7.4548		41.11	97.5		P
Cobalt	75-125	108.1782		9.5936	B	102.77	95.9		P
Copper	75-125	61.9456		13.2883		51.38	94.7		P
Iron									NR
Lead	75-125	95.7537		4.2640		102.77	89.0		P
Magnesium									NR
Manganese	75-125	418.4651		316.2541		102.77	99.5		P
Mercury	75-125	0.6277		0.0499	U	0.50	125.5	N	CV
Nickel	75-125	106.7065		7.7530		102.77	96.3		P
Potassium									NR
Selenium	75-125	375.8992		0.5385	U	411.07	91.4		P
Silver	75-125	10.4616		0.5001	U	10.28	101.8		P
Sodium									NR
Thallium	75-125	376.2897		0.5742	B	411.07	91.4		P
Vanadium	75-125	141.5916		46.3255		102.77	92.7		P
Zinc	75-125	134.2007		40.7112		102.77	91.0		P
Cyanide	75-125	20.4185		0.5189	U	24.04	84.9		CA
Titanium		1490.9771		1425.9035		102.77	63.3		P

Comments:

Titanium sample result >4x the spike concentration, no qualification of the data required.

~~013~~

021

FORM V (Part 1) - IN

~~ILM02.1~~

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WESTINGHOUSE/HANFORD

6

DUPLICATES

SAMPLE NUMBER:

809DP0D

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

Lab Code: SKINER Case No.: N3-11-063SAS No.: SDG No.: 809DP0

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 95.4 % Solids for Duplicate: 95.1

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		6939.0110		6130.8660		12.4		P
Antimony		2.4811	U	2.6004	U			P
Arsenic	1.9	4.4700		3.1084		35.9		P
Barium	38.5	80.1396		82.5976		3.0		P
Beryllium		0.2885	B	0.2782	B	3.6		P
Cadmium		0.2500	U	0.2621	U			P
Calcium		14093.8203		7444.1622		61.7	*	P
Chromium	1.9	7.4548		7.1218		4.6		P
Cobalt	9.6	9.5936	B	9.6980	B	1.1		P
Copper	4.8	13.2883		12.9878		2.3		P
Iron		18618.2755		18882.4383		1.4		P
Lead		4.2640		4.0030		6.3		P
Magnesium	961.7	4534.2642		4351.7175		4.1		P
Manganese		316.2541		318.4567		0.7		P
Mercury		0.0499	U	0.0476	U			CV
Nickel	7.7	7.7530		7.7649	B	0.2		P
Potassium	961.7	1271.5943		1185.6555		7.0		P
Selenium		0.5385	U	0.5644	U			P
Silver		0.5001	U	0.8285	B	200.0		P
Sodium		226.0881	B	226.5965	B	0.2		P
Thallium		0.5742	B	0.4234	B	30.2		P
Vanadium	9.6	46.3255		42.6967		8.2		P
Zinc		40.7112		38.5019		5.6		P
Cyanide		0.5189	U	0.5138	U			CA
Titanium		1425.9035		1336.5586		6.5		P

CJ 3/27/94

~~015~~

022

FORM VI - IN

~~ILM02.1~~

9713505.2121

MEMORANDUM

MAR 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

March 22, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09904-TMA-644 (923-E418 TMA644G.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B09904-TMA-644 prepared by Thermo Analytical 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
B09DP0	11/05/93	SOIL	SEE NOTE 1

Notes:

1. The sample was analyzed for extractable fuel hydrocarbons (kerosene range).

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

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.

RECEIVED 2 1994 VALIDATION DOCUMENTATION SDLA

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Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of one determination reported, which was deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90 percent.

MAJOR DEFICIENCIES

There were no major deficiencies identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

There were no minor deficiencies identified during data validation which required qualification of data.

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.

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.

Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: CJensen	DATE: 3/15/94	PAGE 1 OF 1
COMMENTS: General GC pkg 609904-TMA-644			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
no qualification of the data is required			

-006

9713505.2127

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09DP0	
	Date	11-5-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
KEROSENE	MG/KG	5.000	U

9713505.2128

verified 3/18/94

- 008

TMA Inc. REPORT Work Order # A3-11-043

Received: 11/10/93 Results by Sample

SAMPLE ID B09DP0 FRACTION 01J TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 11/05/93 Category

MODIFIED 8015 - EXTRACTABLE FUEL HYDROCARBONS

Matrix: SOIL
Date Analyzed: 12/01/93
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

verified
cf 3/17/94

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 11-043

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : November 10, 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 in the Kerosene Range (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP0	A3-11-043-01A	V	SOIL
B09DP0 MS	A3-11-043-01B	V	SOIL
B09DP0 MSD	A3-11-043-01C	V	SOIL
B09DP0	A3-11-043-01D	SV	SOIL
B09DP0 MS	A3-11-043-01E	SV	SOIL
B09DP0 MSD	A3-11-043-01F	SV	SOIL
B09DP0	A3-11-043-01J	K	SOIL
B09DP0 MS	A3-11-043-01K	K	SOIL
B09DP0 MSD	A3-11-043-01L	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 :

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.

Di-n-butylphthalate was detected in all of the samples and the blank at concentrations that were below the CRQL. The compound bis(2-Ethylhexyl)phthalate was also found in the sample B09DP0 and B09DP0MS at concentrations less than the CRQL.

In sample B09DP0MS, 4-Nitrophenol was detected at a concentration that exceeded the calibration range, and was therefore "E" qualified. In addition, the matrix spike recovery of 4-Nitrophenol in sample B09DP0MS was above the advisory QC limit. In accordance with CLP 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 approximately 200ppm to 2000ppm. The continuing calibration at the 1000ppm level 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 for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20g of the sample was extracted and concentrated to 5 mL.

There were no hydrocarbons detected in any of the samples. Sample B09DP0 was spiked with Kerosene and the matrix spike

recoveries were 55% for both the MS and the MSD. A blank spike was prepared at the same time, and had a 73% recovery.

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

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 designee, as verified by the following signatures.

Maureen Parrish 1/12/94
Maureen Parrish
Project Manager

9713505.2134

000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), 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

SER 11-5-93

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

Relinquished by:	Received by:	Date/Time:
JG Hogan JG HOGAN	W.U. Setzer W.U. SETZER	11-9-93 1115
W.U. Setzer	H. Narciso / H. NARCISO	11-10-93 10:22

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713505.2135

Attachment 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT:		DATA PACKAGE: B09904-TMA-644
VALIDATOR: C. Jensen	LAB: TMA	DATE: 3/15/94
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	☒ 8015M	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX Soil / B09DP0

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: Verification performed by WHC

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: Matrix spikes were analyzed. The %R were 55%, acceptable. The laboratory did not provide specific limits. The information was requested but not received at time of validation. Spike recovery was considered acceptable (55%) however the laboratory did not provide control limits for evaluation. LCS not analyzed.

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: A laboratory duplicate was not analyzed - no qualification of the data is required (MS/MSD). Were analyzed in duplicate and the RPD for analytes detected were acceptable.

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:

There are no specific CRDLs for kerosene. Reported detection limit of 5 mg/kg is acceptable.

HOLDING TIME SUMMARY

SDG:		VALIDATOR: CJ Jensen			DATE: 3/15/94	PAGE 1 OF 1	
COMMENTS: General GC pkg B09904-TMA-644							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DP0	8015M	11/5/93	11/13/93	12/1/93	8	18	none

9713505.2139

WHC-SD-EN-SPP-002, Rev. 2

9713505.2140

MEMORANDUM

MAR 1994
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TQO

TO: 200-UP-2 Project QA Record

March 22, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE B09904-TMA-644 (923-E418 TMA644V.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09904-TMA-644 prepared by the Thermo Analytical laboratory. The sample validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DP0	11/05/93	SOIL	SEE NOTE 1

Notes:

1. The sample was analyzed for CLP volatile target compound list (TCL) organics.

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

RECEIVED
2 1994
MENTATION

DATA QUALITY OBJECTIVES

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 one sample was validated in this data package with a total of 33 determinations reported, all of

which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives of 90 percent.

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.

Laboratory Blanks

- Methylene chloride and toluene were detected in the laboratory blank. Attachment 2 provides a summary of the samples and data qualifications applied.

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.

9713505.2142

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.

9713505.2144

Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 3/14/94	PAGE 1 OF 1
COMMENTS: VOA pkg B09904-TMA-644			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	B09DP0	Blank Contam
Toluene	U	B09DP0	Blank Contam

9713505.2146

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09DP0	
	Date	11-5-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
CHLOROMETHANE	UG/KG	10.000	U
BROMOMETHANE	UG/KG	10.000	U
VINYL CHLORIDE	UG/KG	10.000	U
CHLOROETHANE	UG/KG	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U
ACETONE	UG/KG	6.000	J
CARBON DISULFIDE	UG/KG	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U
CHLOROFORM	UG/KG	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U
2-BUTANONE	UG/KG	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U
BENZENE	UG/KG	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U
BROMOFORM	UG/KG	10.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U
2-HEXANONE	UG/KG	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U
TOLUENE	UG/KG	10.000	U
CHLOROBENZENE	UG/KG	10.000	U
ETHYLBENZENE	UG/KG	10.000	U
STYRENE	UG/KG	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U

Validated
Initials

9713505.2147

9713505.2148

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. ~~000084~~

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31116R03

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: not dec. 4 Date Analyzed: 11/16/93

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 ~~3~~	~~BJ~~	U
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 ~~2~~	~~J~~	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	

03/14/94

9713505.2149

~~000085~~

EPA SAMPLE NO.

B09DP0

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31116R03

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: not dec. 4 Date Analyzed: 11/16/93

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

93/14/94

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 11-043

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : November 10, 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 in the Kerosene Range (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP0	A3-11-043-01A	V	SOIL
B09DP0 MS	A3-11-043-01B	V	SOIL
B09DP0 MSD	A3-11-043-01C	V	SOIL
B09DP0	A3-11-043-01D	SV	SOIL
B09DP0 MS	A3-11-043-01E	SV	SOIL
B09DP0 MSD	A3-11-043-01F	SV	SOIL
B09DP0	A3-11-043-01J	K	SOIL
B09DP0 MS	A3-11-043-01K	K	SOIL
B09DP0 MSD	A3-11-043-01L	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 :

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.

Di-n-butylphthalate was detected in all of the samples and the blank at concentrations that were below the CRQL. The compound bis(2-Ethylhexyl)phthalate was also found in the sample B09DP0 and B09DP0MS at concentrations less than the CRQL.

In sample B09DP0MS, 4-Nitrophenol was detected at a concentration that exceeded the calibration range, and was therefore "E" qualified. In addition, the matrix spike recovery of 4-Nitrophenol in sample B09DP0MS was above the advisory QC limit. In accordance with CLP 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 approximately 200ppm to 2000ppm. The continuing calibration at the 1000ppm level 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 for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20g of the sample was extracted and concentrated to 5 mL.

There were no hydrocarbons detected in any of the samples. Sample B09DP0 was spiked with Kerosene and the matrix spike

recoveries were 55% for both the MS and the MSD. A blank spike was prepared at the same time, and had a 73% recovery.

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

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 designee, as verified by the following signatures.

Maureen Parrish 1/12/99
Maureen Parrish
Project Manager

9713505.2154

~~000002A~~

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml GW:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), 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

SER 11-5-93

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

Relinquished by:	Received by:	Date/Time:
JG Hogan	W.U. Setzer W.U. SETZER	11-9-93 1115
W.U. Setzer	H. Narciso / H. NARCISO	11-10-93 10:22

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713505.2155

Attachment 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200UP2	DATA PACKAGE: 609904-TMA-644	
VALIDATOR: C Tenaen	LAB: TMA	DATE: 3/14/94
CASE:	SDG:	

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 / 609DP0

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: Information not available to identify if this sample is a QC sample. Will be evaluated in the final summary report. Methyl and Ethylene were detected in the blank, sample B09DF0 was qualified U for these compounds.

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:

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

SDG:	VALIDATOR: C Jensen	DATE: 5/14/94	PAGE 1 OF 1
COMMENTS: VOA pkg B09904-TMA-644			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DP0	VOA	11/5/93	—	11/16/93	—	11	none

BLANK AND SAMPLE DATA SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 3/14/94	PAGE 1 OF 1
COMMENTS: VOA pkg B09904-TMA-604			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLKHIGER	methylene Chloride	2	J		ug/kg		20	B09DP0	U
VBLKHIGER	toluene	.8			ug/kg		8	B09DP0	U

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~~000094~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK1116R

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: SBLK1116

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31116R02

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 11/16/93

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	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

X10 = 2

FORM I VOA 3/90

Blank Contamination

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VBLK11lek Quant sheet associated with sample B09DP0

~~000165~~

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	201	8:22	1	1.000	A BB	23673.	50.000 PPB	16.18
2	114	397	16:32	2	1.000	A BB	111331.	50.000 PPB	16.18
3	117	492	20:30	3	1.000	A BB	100303.	50.000 PPB	16.18
4	65	254	10:35	1	1.264	A BB	35075.	51.188 PPB	16.56
5	98	468	19:30	3	0.951	A BB	100346.	51.774 PPB	16.75
6	95	576	24:00	3	1.171	A BB	77705.	50.054 PPB	16.20
7	NOT FOUND								
8	NOT FOUND								
9	NOT FOUND								
10	NOT FOUND								
11	84	134	5:35	1	0.667	A BB	1705.	2.226 PPB	0.72
12	NOT FOUND								
13	NOT FOUND								
14	NOT FOUND								
15	NOT FOUND								
16	NOT FOUND								
17	NOT FOUND								
~~18~~	~~43~~	~~254~~	~~10:35~~	~~1~~	~~1.264~~	~~A BB~~	~~660.~~	~~0.965 PPB~~	~~0.31~~
19	NOT FOUND								
20	NOT FOUND								
21	NOT FOUND								
22	NOT FOUND								
23	NOT FOUND								
24	NOT FOUND								
25	NOT FOUND								
26	NOT FOUND								
27	NOT FOUND								
28	NOT FOUND								
29	NOT FOUND								
30	NOT FOUND								
31	NOT FOUND								
32	NOT FOUND								
~~33~~	~~43~~	~~412~~	~~17:10~~	~~3~~	~~0.837~~	~~A BB~~	~~1003.~~	~~0.562 PPB~~	~~0.18~~
~~34~~	~~43~~	~~442~~	~~18:25~~	~~3~~	~~0.898~~	~~A BB~~	~~921.~~	~~0.674 PPB~~	~~0.22~~
35	NOT FOUND								
36	NOT FOUND								
~~37~~	~~91~~	~~472~~	~~19:40~~	~~3~~	~~0.959~~	~~A BB~~	~~2066.~~	~~0.820 PPB~~	~~0.27~~
38	NOT FOUND								
39	NOT FOUND								
40	NOT FOUND								
41	NOT FOUND								
42	NOT FOUND								
43	NOT FOUND								

11/19/93

toluene

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	8:32	0.98	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	16:50	0.98	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	20:45	0.99	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	10:50	0.98	1.268	1.00	51.19	50.00	1.482	1.447	1.02
5	19:47	0.99	0.954	1.00	51.77	50.00	1.000	0.966	1.04
6	24:22	0.98	1.175	1.00	50.05	50.00	0.775	0.774	1.00
7	1:10		0.137						
8	2:05		0.244						
9	2:40		0.312						
10	3:37		0.424						
11	5:42	0.98	0.668	1.00	2.23	50.00	0.072	1.618	0.04

cy 2/22/94

12/03/93

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MEMORANDUM

MAR 1994 RECEIVED TOD

TO: 200-UP-2 Project QA Record March 18, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09904-TMA-644 (923-E418 TMA644W.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09904-TMA-644 prepared by the Thermo Analytical laboratory. The samples validated along with the analyses reported and the methods of analysis are provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09DP0	11/05/93	SOIL	SEE NOTE 1
B09904	10/29/93	SOIL	SEE NOTE 2
B09905	11/01/93	SOIL	SEE NOTE 2
B09906	11/01/93	SOIL	SEE NOTE 2
B09907	11/02/93	SOIL	SEE NOTE 2
B09908	11/02/93	SOIL	SEE NOTE 2

Notes:

1. The sample was analyzed for nitrate+nitrite and anions (chloride, fluoride and sulfate).

2. The samples were analyzed for nitrate+nitrite only.

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

RECEIVED MAR 24 1994 VALIDATION DOCUMENTATION SDLA

DATA QUALITY OBJECTIVES

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 six samples were validated in this data package with a total of 9 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets normal work plan objectives of 90 percent. Two sets of nitrate/nitrite data were submitted in this data package and were validated together (see telecon in Attachment 5).

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.

Matrix Spike Recovery

- The matrix spike recovery was unacceptable for nitrate+nitrite associated with sample B09DP0. Attachment 2 provides a summary of the data qualification applied.

Correlation Coefficient

- The correlation coefficient (r) for the initial calibration of nitrate+nitrite associated with sample B09DP0 was unacceptable. Attachment 2 provides a summary of the data qualification applied.

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.

9713505.2165

Attachment 1

Glossary of Data Reporting Qualifiers

-00:

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.

9713505.2167

Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 3/14/97	PAGE 1 OF 1
COMMENTS: Gas Chem pkg B09904-TMA-644			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO_2 / NO_3	J	B09DP0, B09DP0dup	r < .995
NO_2 / NO_3	J	B09DP0, B09DP0dup	spike < 75% R

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Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09904		B09905		B09906		B09907		B09908		B09DP0	
	Date	10-29-93		11-1-93		11-1-93		11-2-93		11-2-93		11-5-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/KG	---		---		---		---		---		9.500	
FLUORIDE	MG/KG	---		---		---		---		---		1.900	
SULFATE	MG/KG	---		---		---		---		---		14.000	
NITRATE+NITRITE	MG-N/K	68.700		106.000		197.000		15.300		12.100		11.400	J

9312905.2170

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Received: 11/11/93 Results by Sample

SAMPLE ID B09DP0 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/05/93 Category SOIL

NITR_S 11.4 J
mg N/kg

SAMPLE ID B09DP0D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 11/05/93 Category SOIL

NITR_S 7.79 J
mg N/kg

SAMPLE ID B09DP0S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 11/05/93 Category SOIL

NITR_S 25.4 J 3/14/94
mg N/kg

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

NITR_S 2.06 J 3/14/94
mg N/L

3/14/94

-009

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
1-800-4LAB TEST FAX (617) 890-3883

9713505.2172

Received: 11/09/93 Results by Sample

SAMPLE ID B09904 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 10/29/93 Category SOIL

NITR_S 68.7
mg N/kg

SAMPLE ID B09904 Dup. SAMPLE # 01 FRACTIONS: B
Date & Time Collected 10/29/93 Category SOIL

NITR_S 65.9
mg N/kg

SAMPLE ID B09904 Spike SAMPLE # 01 FRACTIONS: C
Date & Time Collected 10/29/93 Category SOIL

NITR_S 88.0
mg N/kg

SAMPLE ID B09905 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 11/01/93 Category SOIL

NITR_S 106
mg N/kg

SAMPLE ID B09906 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 11/01/93 Category SOIL

NITR_S 197
mg N/kg

SAMPLE ID B09907 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 11/02/93 Category SOIL

NITR_S 15.3
mg N/kg

SAMPLE ID B09908 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 11/02/93 Category SOIL

NITR_S 12.1
mg N/kg

-010

GS 3/17/94

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.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4LAB TEST FAX (617) 890-2883

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~~000009~~

TMA Inc. REPORT Work Order # A3-11-043

Received: 11/10/93

Results by Sample

SAMPLE ID B09DP0 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids

Date & Time Collected 11/05/93 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	9.5	mg/kg	2.0
Fluoride	300.0	1.9	mg/kg	1.0
Sulfate	300.0	14	mg/kg	10

FORM I

ij 3/14/94

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

GENERAL CHEMISTRY RESULTS

CASE NO. 11-043

Soil Sample #

B09DP0

CASE NARRATIVE

Sample B09DP0 (A3-11-043-01G, 01I Dup) did not exhibit homogeneity. Therefore, the Relative Percent Difference for Chloride was 33.3% and 30.3% for Sulfate. The sample, duplicate, and matrix spike was reanalyzed within holding time. The second analysis also exhibited the same inhomogeneity. The second analysis has been included only to demonstrate the matrix effects on the analytes concentration.

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

Maureen Parrish 11/12/94

Maureen Parrish

Received: 11/09/93

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)

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.

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

Received: 11/11/93

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

9713505.2178

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: 10-29-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351 — Offsite Property No.: W44-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE — LEP 11-8-93

Shipped to: TMA

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

Sample Identification

1) B09904
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

LEP 10-29-93

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

~~024A~~

016

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

9713505.2179

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: 11-1-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351 — Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE JER 11-8-93

Shipped to: TMA

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

Sample Identification

1) B09905
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

JER 11-1-93

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E. Rogers 11-8-93	K. Blum Hermit Blum	11-9-93 1145
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:

~~024C~~

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

9713505.2180

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 11-1-93

Ice Chest No. JML-353

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. 2519010351

Offsite Property No. W94-0-0009-41

Method of Shipment ~~OVERNIGHT~~ AIR SERVICE

Shipped to TMA

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

Sample Identification

1) B09906

~~1,~~125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1,~~1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E. Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

~~024E~~

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

9713505.2181

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: 11-2-93

Ice Chest No.: SML-353 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351 — Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09907
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B09908
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ SER 11-2-93
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
1045 Loren E. Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

~~0240~~

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

9713505.2182

000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), 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

SER 11-5-93

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

Relinquished by:	Received by:	Date/Time:
JG Hogan	W.U. Setzer	11-9-93 1115
W.U. Setzer	H. Narciso	11-10-93 10:22

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

-020

9713505.2183

Attachment 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200 UP2		DATA PACKAGE: B09904-TMA-644
VALIDATOR: C Jensen	LAB: TMA	DATE: 3/14/94
CASE: 11-043		SDG:

ANALYSES PERFORMED

☒ Aniona/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 ~~[illegible]~~ 3/14/94 B09DP0 / Soil

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:

-022

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: The r for NO_2/NO_3 was .993, results for sample B09DP0 qualified J, also B09DP0 duplicate

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: Information not available at the time of validation to determine whether sample is a QC sample. Information will be requested and ~~sum~~ evaluated in the final summary.

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 MS analyzed for NO_2/NO_3 was 70.7%R. Results qualified as J for sample B09DP0

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . (Yes) No N/A 3/14/94

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)

-02:

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: ~~NO_2/NO_3 duplicate RPD range for sample B0B0P0 is~~ 5 3/14/93. Duplicate results are acceptable for all analyses.

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

SDG:		VALIDATOR: C. Jensen		DATE: 3/14/93		PAGE 1 OF 1	
COMMENTS: Gen Chem pkg. B09904-TMA-644							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DPO	Anions	11/5/93	—	12/1/93	—	26	none
	NO_2/NO_3	11/5/93	—	12/2/93	—	27	none
B09904	NO_2/NO_3	10/29/93		11/12/93		14	none
B09905		11/1/93				11	
B09906		11/1/93				11	
B09907		11/2/93				10	
B09908		11/2/93				10	

9713505.2188

Received: 11/11/93 12/22/93 14:53:05

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
S311126-01	11.4 mg/kg	19.8 mg/kg	25.4 mg/kg	70.7

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S311126-01	11.4 mg/kg	7.79 mg/kg	37.6

range ok
no qual
results < 2x CRDL

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.06 mg/L	103.0
Prep blank	--	<0.25 mg/L	--

Associated with sample B0YDP0 only.

MS below 75-125

all results qualified J sj 3/14/94

-026

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
1-800-4LAB TEST FAX (617) 890-3883

9713505.2189

Golder Associates

Telecon/Contact Memorandum

☐ Personal Visit
☒ Telephone ☐ Incoming ☒ Outgoing

Company Name: WHC HASM
Address:

Person: Jeanette Duncan
Telephone: 1-509-372-3395
Job/subject: pkg B09904-TMA-644 DV

ROUTE TO:
Files ☒ Project
☐ Business Development
☐ Mailing List

Job No. 923-E418
Date: 3/15/94
Time: 300

Remarks:

Jeanette instructed GM to validate both sets of NO_2/NO_3 data in one memo. The two sets are: B09DP0 in one package
B09904, B09905, -06, -07, and -08 in the 2nd package.

Action/Next Contact:
Include a copy of this telecon in DV pkg

BY: C. Jensen

9713505.2190

RECORD COPY

MEMORANDUM

TO: 200-UP-2 Project QA Record April 20, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: SEMIVOLATILE ORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: B09904-TMA-644 (923-E418 TMA644S.UP2)

INTRODUCTION

This memorandum presents the results of data validation on data package B09904-TMA-644 prepared by Thermo Analytical 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
B09DP0	11/05/93	SOIL	SEE NOTE 1

Notes:
1. All samples were analyzed for CLP target compound list (TCL) semivolatile organics.

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.

-001

revised page
cj 4/20/94

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 64 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the normal work plan objectives of 90 percent.

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.

Laboratory Blanks

- Di-n-butylphthalate was detected in the laboratory blank. 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:

- One TIC for sample B09DP0 was reported as an unknown hydrocarbon with spectra supporting identification as an aldol condensation product, resulting in qualification of the TIC as unusable (UR) as shown in Attachment 3.

- 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).

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.

revised page of 4/20/94 -002

9713505.2192

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.

revised page
Hoolat

9713505.2194

Attachment 2

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR: C Fuser	DATE: 4/20/94	PAGE 1 OF 1
COMMENTS: Semivolatile			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate	U	B09DP0	detected in blank

revised page
gj 4/20/94

006

9713505.2196

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09DP0	
	Date	11-5-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
PHENOL	UG/KG	340.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	340.000	U
2-CHLOROPHENOL	UG/KG	340.000	U
1,3-DICHLOROBENZENE	UG/KG	340.000	U
1,4-DICHLOROBENZENE	UG/KG	340.000	U
1,2-DICHLOROBENZENE	UG/KG	340.000	U
2-METHYLPHENOL	UG/KG	340.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	340.000	U
4-METHYLPHENOL	UG/KG	340.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	340.000	U
HEXACHLOROETHANE	UG/KG	340.000	U
NITROBENZENE	UG/KG	340.000	U
ISOPHORONE	UG/KG	340.000	U
2-NITROPHENOL	UG/KG	340.000	U
2,4-DIMETHYLPHENOL	UG/KG	340.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	340.000	U
2,4-DICHLOROPHENOL	UG/KG	340.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	340.000	U
NAPHTHALENE	UG/KG	340.000	U
4-CHLOROANILINE	UG/KG	340.000	U
HEXACHLOROBUTADIENE	UG/KG	340.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	340.000	U
2-METHYLNAPHTHALENE	UG/KG	340.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	340.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	340.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	830.000	U
2-CHLORONAPHTHALENE	UG/KG	340.000	U
2-NITROANILINE	UG/KG	830.000	U
DIMETHYLPHTHALATE	UG/KG	340.000	U
ACENAPHTHYLENE	UG/KG	340.000	U
3-NITROANILINE	UG/KG	830.000	U
ACENAPHTHENE	UG/KG	340.000	U

Verified
cj 3/17/94

9713505.2197

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09DP0	
	Date	11-5-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
2,4-DINITROPHENOL	UG/KG	830.000	U
4-NITROPHENOL	UG/KG	830.000	U
DIBENZOFURAN	UG/KG	340.000	U
2,4-DINITROTOLUENE	UG/KG	340.000	U
2,6-DINITROTOLUENE	UG/KG	340.000	U
DIETHYLPHTHALATE	UG/KG	340.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	340.000	U
FLUORENE	UG/KG	340.000	U
4-NITROANILINE	UG/KG	830.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	830.000	U
N-NITROSODIPHENYLAMINE	UG/KG	340.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	340.000	U
HEXACHLOROBENZENE	UG/KG	340.000	U
PENTACHLOROPHENOL	UG/KG	830.000	U
PHENANTHRENE	UG/KG	340.000	U
ANTHRACENE	UG/KG	340.000	U
CARBAZOLE	UG/KG	340.000	U
DI-N-BUTYLPHTHALATE	UG/KG	340.000	U
FLUORANTHENE	UG/KG	340.000	U
PYRENE	UG/KG	340.000	U
BUTYLBENZYLPHTHALATE	UG/KG	340.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	340.000	U
BENZO(A)ANTHRACENE	UG/KG	340.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	39.000	J
CHRYSENE	UG/KG	340.000	U
DI-N-OCTYLPHTHALATE	UG/KG	340.000	U
BENZO(B)FLUORANTHENE	UG/KG	340.000	U
BENZO(K)FLUORANTHENE	UG/KG	340.000	U
BENZO(A)PYRENE	UG/KG	340.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	340.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	340.000	U
BENZO(G,H,I)PERYLENE	UG/KG	340.000	U

Verified 6/30/94

9713505.2198

9713505.2199

000086

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 31202S08

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	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

3/14/94

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EPA SAMPLE NO.

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B09DP0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 31202S08

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	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	340 ~~65~~	~~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	39	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

FORM I SV-2 3/90

G 3/14/94

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EPA SAMPLE NO.

B09DP0

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-01D

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 31202S08

Level: (low/med) LOW Date Received: 11/10/93

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	6.87	5700	~~J~~	UR
2.	UNKNOWN HYDROCARBON	7.17	380	~~BJ~~	UJN
3.	UNKNOWN HYDROCARBON	8.17	830	~~BJ~~	UJN
4.	UNKNOWN ALCOHOL	8.53	760	~~BJ~~	JN
5.	UNKNOWN HYDROCARBON	10.95	140	~~J~~	JN
6.	UNKNOWN HYDROCARBON	11.75	790	~~BJ~~	UJN
7.	UNKNOWN CARBOXYLIC ACID ESTE	20.73	1000	~~BJ~~	UJN
8.	HEXANEDIOIC ACID ESTER	25.63	240	~~BJ~~	UJ
9.	UNKNOWN ALKANE	28.37	100	~~J~~	JN
10.	UNKNOWN ALKANE	30.87	340	~~J~~	JN

4/20/94

revised page. 4/20/94

3/14/94

FORM I SV-TIC 3/90

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Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 11-043

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : November 10, 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 in the Kerosene Range (K) were analyzed according to the SW-846 Method 8015M.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B09DP0	A3-11-043-01A	V	SOIL
B09DP0 MS	A3-11-043-01B	V	SOIL
B09DP0 MSD	A3-11-043-01C	V	SOIL
B09DP0	A3-11-043-01D	SV	SOIL
B09DP0 MS	A3-11-043-01E	SV	SOIL
B09DP0 MSD	A3-11-043-01F	SV	SOIL
B09DP0	A3-11-043-01J	K	SOIL
B09DP0 MS	A3-11-043-01K	K	SOIL
B09DP0 MSD	A3-11-043-01L	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 :

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.

Di-n-butylphthalate was detected in all of the samples and the blank at concentrations that were below the CRQL. The compound bis(2-Ethylhexyl)phthalate was also found in the sample B09DP0 and B09DP0MS at concentrations less than the CRQL.

In sample B09DP0MS, 4-Nitrophenol was detected at a concentration that exceeded the calibration range, and was therefore "E" qualified. In addition, the matrix spike recovery of 4-Nitrophenol in sample B09DP0MS was above the advisory QC limit. In accordance with CLP 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 approximately 200ppm to 2000ppm. The continuing calibration at the 1000ppm level 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 for extractable hydrocarbons in the Kerosene range within the required holding times. Approximately 20g of the sample was extracted and concentrated to 5 mL.

There were no hydrocarbons detected in any of the samples. Sample B09DP0 was spiked with Kerosene and the matrix spike

recoveries were 55% for both the MS and the MSD. A blank spike was prepared at the same time, and had a 73% recovery.

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

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 designee, as verified by the following signatures.

Maureen Parrish 1/12/94
Maureen Parrish
Project Manager

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000002A

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), 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

SER 11-5-93

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

Relinquished by:	Received by:	Date/Time:
JG Hogan	W.U. Setzer	11-9-93 1115
W.U. Setzer	H. Narciso	11-10-93 10:22

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9713505.2207

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: 609904-TMA-644	
VALIDATOR: C Jensen	LAB: TMA		DATE: 3/14/94
CASE:		SDG:	

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/ BOPO

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:

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 % R for 2,4 Dinitrotoluene was 98% which was above the control limit of 28-89%. Since this recovery is near 100%, no qualification of the data is required. Also, the surrogate recoveries were within limits.

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:

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: An aldol condensation product @ 6.87 min. was identified in the unknown search and labeled "Unknown hydrocarbon". This appears to be more similar to 4-hydroxy-4-methyl-2-pentanone, qualified as NR - common lab contam. This was also identified at the same retention time as the blank. 5/4/20/94

revised page 5/4/20/94

HOLDING TIME SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 3/14/94	PAGE 1 OF 1
COMMENTS: SVOA pkg B09904-TW24-644			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09DR0	SVOA	11/5/93	11/13/93	12/02/93	8	19	none

9713505.2211
WHC-SD-EN-SPP-002, Rev. 2

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BLANK AND SAMPLE DATA SUMMARY

SDG:	VALIDATOR: C Jensen	DATE: 3/14/94	PAGE 1 OF 1
COMMENTS: SVOA pkg. B09904-TMA-644			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK113552	Di-n-butyl phthalate	56	J		ug/kg		560	B09DP0	2L
	unknown hydrocarbon	360		7.17			3600		UJN
		750		8.17			7500		UJN
		360		11.75			3600		UJN
	unk. acid ester	920		20.73			9200		UJN
	hexanedioic acid ester	200		25.63			2000		UJN
								TICs requalified	
								UJN for sample	
								B09DP0	SJ 4/20/94

revised page - 23
SJ 4/20/94

9713505.2212
WHC-SD-EN-SPP-002, Rev. 2

9713505.2213

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1113S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-BLK

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31202S07

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

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	790	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	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	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	790	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	56	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

(1) - Cannot be separated from Diphenylamine

SJ 3/14/94

9713505.2214

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EPA SAMPLE NO.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SBLK1113S2

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 11043 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A311043-BLK

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 31202S07

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 11/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/02/93

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	6.68	160	J
2.	UNKNOWN HYDROCARBON	6.87	5200	J
3.	UNKNOWN HYDROCARBON	7.17	360	J
4.	UNKNOWN HYDROCARBON	8.17	750	J
5.	UNKNOWN ALCOHOL	13.87	460	J
6.	UNKNOWN HYDROCARBON	9.77	98	J
7.	UNKNOWN HYDROCARBON	11.73	360	J
8.	PROPANOIC ACID ISOMER	17.52	66	J
9.	UNKNOWN CARBOXYLIC ACID ESTE	20.72	920	J
10.	HEXANEDIOIC ACID ESTER ISOME	25.62	200	J

S 3/14/94

9713505.2215

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

APR 1994 RECEIVED TQO

April 26, 1994

Our ref: 923-E418
S/O/3037

Westinghouse Hanford Company
Hanford Analytical Services
P.O. Box 1970
Richland, Washington 99352

ATTENTION: Jeanette Duncan

RE: DATA VALIDATION COMMENT RESPONSES, 200-UP-2 DATA VALIDATION PROJECT, TASK ORDER S94-18, CONTRACT MJK-SVV-073750

Dear Ms. Duncan:

Enclosed are revised data validation packages for the 200-UP-2 data validation project. The following provides a summary of the data package identification numbers and the associated page revisions:

Data Package	Revisions
B09DT4-TMA-690	no page changes
B09904-TMA-644	radiochemistry pages: 30, 30A, 31 and 32

Sincerely,

GOLDER ASSOCIATES INC.

Christina Y Jensen

Christina Jensen
Task Manager

Douglas G. Dunster

Douglas G. Dunster
Project Director

cc: P.K. Brockman, SAIC
K. Angelos

9713505.2216

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

APR 1994
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TQO

April 5, 1994

Our ref: 923-E418
S/O/2938

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF 200-UP-1 DATA VALIDATION PACKAGE,
TASK ORDER: S-94-18, CONTRACT NO. MJK-SVV-073750

Dear Ms. Duncan:

Enclosed is the radiochemistry data validation package for the 200-UP-2 project. The data package included in this shipment is as follows:

- B09904-TMA-644

Two copies of the validation documentation is located in the front of the data package folder. Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Kent M. Angelos
Project Manager

RECEIVED
APR 6 1994
VALIDATION DOCUMENTATION
SDLA

Enclosures

KMA/ah 2938.ltr

cc: P.K. Brockman, SAIC
C. Jensen

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MEMORANDUM

APR 1994
RECEIVED
TQD

TO: 200 UP-2 Project QA Record

April 5, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B09904-TMA-644 (923-E418 644RAD.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B09904-TMA-644 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
B09904	10/29/93	SOIL	SEE NOTE 1.
B09905	11/01/93	SOIL	SEE NOTE 1.
B09906	11/01/93	SOIL	SEE NOTE 1.
B09907	11/02/93	SOIL	SEE NOTE 1.
B09908	11/02/93	SOIL	SEE NOTE 1.
B09DP0	11/05/93	SOIL	SEE NOTE 2.

NOTES:

1. Indicates the samples were analyzed for gross alpha/beta, technetium-99 (beta counting), isotopic uranium, (alpha spectroscopy), and total uranium (laser fluorometry),

2. Indicates the sample was 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

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APR 6 1994
VALIDATION DOCUMENTATION
SDLA

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 with the exception of the relative percent difference (RPD) as indicated below.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were acceptable for all sample results except for minimum detectable activities (MDAs) which exceeded the required detection limits as follows:

Sample ID	Isotope	MDA	RDL
B09DP0	IRON-59	0.1	0.05
B09DP0	COBALT-58	0.06	0.05
B09DP0	EUROPIUM-152	0.6	0.1
B09DP0	EUROPIUM-154	0.4	0.1
B09DP0	EUROPIUM-155	0.8	0.1

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of 70 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.

Laboratory Precision

- The RPD for cesium-137 and thorium-228 was unacceptable, therefore sample results have been qualified as estimated (J). Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.

Results Verification

- The gross alpha result for sample B09DP0 has been changed on the laboratory result form due to a calculation error. Attachment 5 provides supporting documentation.

DATA REPORTING

- Laboratory results reported below the MDA have been elevated to the MDA and reported with a U as shown in Attachment 3.

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.

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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: B09904-TMA-644	REVIEWER: T. STAPP	DATE: 3-29-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
CESIUM-137, THORIUM-228	J	B09DP0	DUPLICATE RELATIVE PERCENT DIFFERENCE EXCEEDED THE 35% LIMIT

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09904-TMA-644

	Samp#	B09904		B09905		B09906		B09907		B09908		B09DP0	
	Date	10-29-93		11-1-93		11-1-93		11-2-93		11-2-93		11-5-93	
	Location	299-W22-78		299-W22-78		299-W22-78		299-W22-78		299-W22-78		299-W19-96	
	Depth	194.00 - 196.50		198.50 - 200.00		209.50 - 212.00		222.00 - 224.50		230.00 - 232.50		4.00 - 6.00	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	5.600		6.300		9.800		8.500		6.800		9.200	
GROSS BETA	pCi/g	13.000		17.000		28.000		19.000		19.000		360.000	
SELENIUM-79	pCi/g	---		---		---		---		---		2.000	U
STRONTIUM-90	pCi/g	---		---		---		---		---		42.000	
TECHNETIUM-99	pCi/g	0.400	U	0.590		1.000		0.300	U	0.300	U	0.400	U
IODINE-129	pCi/g	---		---		---		---		---		1.000	U
URANIUM-233/234	pCi/g	1.100		0.530		0.790		0.570		0.390		0.690	
URANIUM-235	pCi/g	0.067		0.090	U	0.057		0.090	U	0.100	U	0.100	U
URANIUM-238	pCi/g	1.100		0.500		0.760		0.580		0.400		0.640	
TOTAL URANIUM	UG/G	3.000		1.400		2.900		1.700		1.200		2.000	
NEPTUNIUM-237	pCi/g	---		---		---		---		---		0.007	
PLUTONIUM-238	pCi/g	---		---		---		---		---		0.040	U
PLUTONIUM-239/240	pCi/g	---		---		---		---		---		0.020	U
AMERICIUM-241	pCi/g	---		---		---		---		---		0.050	U
CURIUM-244	pCi/g	---		---		---		---		---		0.050	U
SODIUM-22	pCi/g	---		---		---		---		---		0.050	U
POTASSIUM-40	pCi/g	---		---		---		---		---		12.000	
MANGANESE-54	pCi/g	---		---		---		---		---		0.050	U
IRON-59	pCi/g	---		---		---		---		---		0.100	U
COBALT-58	pCi/g	---		---		---		---		---		0.060	U
COBALT-60	pCi/g	---		---		---		---		---		0.040	U
NIOBIUM-94	pCi/g	---		---		---		---		---		0.040	U
RUTHENIUM-103	pCi/g	---		---		---		---		---		0.500	U
RUTHENIUM-106	pCi/g	---		---		---		---		---		2.000	U
TIN-113	pCi/g	---		---		---		---		---		0.500	U
CESIUM-134	pCi/g	---		---		---		---		---		0.060	U
CESIUM-137	pCi/g	---		---		---		---		---		320.000	J
CERIUM-144	pCi/g	---		---		---		---		---		1.000	U
EUROPIUM-152	pCi/g	---		---		---		---		---		0.600	U
EUROPIUM-154	pCi/g	---		---		---		---		---		0.400	U
EUROPIUM-155	pCi/g	---		---		---		---		---		0.800	U
RADIUM-226	pCi/g	---		---		---		---		---		0.690	
RADIUM-228	pCi/g	---		---		---		---		---		0.750	
THORIUM-228	pCi/g	---		---		---		---		---		1.000	J
THORIUM-232	pCi/g	---		---		---		---		---		0.750	

Verified 4-4-94

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N311062-01

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09904

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-01	Client sample id	B09904
Dept sample id	7296-001	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	10/29/93
% moisture	15.4	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	5.6	3.7	4	10	~~J~~	80A
Gross Beta	Beta	13	3.9	5	10		80B
Technetium 99	14133-76-7	~~0.36~~	~~0.16~~	0.4	0.5	U	TC
Uranium 233/234		1.1	0.19	0.08	0.3		U
Uranium 235	15117-96-1	0.067	0.045	0.06	0.3	~~J~~	U
Uranium 238		1.1	0.18	0.06	0.3		U
Total Uranium (ug/g)	7440-61-1	3.0	0.53	0.03	0.1		U_T

Verified RS 4-4-94

RS 4/4/94

~~25~~

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

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TMA NORCAL
REPORTING GROUP 7296

N311062-02

DATA SHEET

B09905

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-02	Client sample id	B09905
Dept sample id	7296-002	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/01/93
% moisture	12.7	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	6.3	4.4	5	10	~~J~~	80A
Gross Beta	Beta	17	4.1	5	10		80B
Technetium 99	14133-76-7	0.59	0.16	0.4	0.5		TC
Uranium 233/234		0.53	0.16	0.1	0.3		U
Uranium 235	15117-96-1	~~0~~	~~0.022~~	0.09	0.3	U	U
Uranium 238		0.50	0.14	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.4	0.25	0.03	0.1		U_T

Verified RS 4-4-94

DATA SHEETS
Page 2
SUMMARY DATA SECTION
Page 18

RS 4-4-94

~~26~~

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

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TMA NORCAL
REPORTING GROUP 7296

N311062-03

B09906

DATA SHEET

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-03	Client sample id	B09906
Dept sample id	7296-003	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/01/93
% moisture	18.3	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	9.8	4.3	4	10	~~J~~	80A
Gross Beta	Beta	28	4.6	5	10		80B
Technetium 99	14133-76-7	1.0	0.20	0.4	0.5		TC
Uranium 233/234		0.79	0.12	0.05	0.3		U
Uranium 235	15117-96-1	0.057	0.035	0.03	0.3	~~J~~	U
Uranium 238		0.76	0.12	0.03	0.3		U
Total Uranium (ug/g)	7440-61-1	2.9	0.51	0.03	0.1		U_T

Verified RS 4-4-94

RS 4-4-94

2nd

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

9713505.2229

N311062-04

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09907

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-04	Client sample id	B09907
Dept sample id	7296-004	Location/Matrix	200-UP-2 SOLID
Received	11/09/93	Collected	11/02/93
% moisture	14.4	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	8.5	4.0	4	10	~~J~~	80A
Gross Beta	Beta	19	4.2	5	10		80B
Technetium 99	14133-76-7	~~0.11~~	~~0.091~~	0.3	0.5	U	TC
Uranium 233/234		0.57	0.16	0.09	0.3		U
Uranium 235	15117-96-1	~~0.023~~	~~0.046~~	0.09	0.3	U	U
Uranium 238		0.58	0.16	0.07	0.3		U
Total Uranium (ug/g)	7440-61-1	1.7	0.29	0.03	0.1		U_T

Verified RS 4-4-94

RS 4-4-94

~~28~~

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

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TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09908

Client Westinghouse Hanford
Contract MBH-SVV-069262

Client sample id B09908
Location/Matrix 200-UP-2 SOLID
Collected 11/02/93
Chain of custody id EFL-1091

	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
	6.8	3.4	3	10	~~J~~	80A
	19	4.3	5	10		80B
-7	~~0.099~~	~~0.13~~	0.3	0.5	U	TC
	0.39	0.14	0.1	0.3		U
-1	~~0.014~~	~~0.027~~	0.1	0.3	U	U
	0.40	0.14	0.09	0.3		U
-1	1.2	0.21	0.03	0.1		U_T

Verified RF 4-4-94

RF 4-4-94

29

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 01/20/94

9713505.2231

N311062-06

TMA NORCAL
REPORTING GROUP 7296

DATA SHEET

B09DP0

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-06	Client sample id	B09DP0
Dept sample id	7296-006	Location/Matrix	200-UP-2 SOLID
Received	11/10/93	Collected	11/05/93
% moisture	3.9	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	~~9.0~~ 9.2 4-1-94	5.5	4	10	~~J~~	80A
Gross Beta	Beta	360	13	6	10		80B
Selenium 79	15758-45-9	~~0.028~~	~~0.96~~	2	10	U	SE
Strontium 90	10098-97-2	42	1.6	0.8	1		Y
Technetium 99	14133-76-7	~~0.18~~	~~0.14~~	0.4	0.5	U	TC
Iodine 129	15046-84-1	~~0.078~~	~~0.56~~	1	2	U	I
Uranium 233/234		0.69	0.18	0.08	0.3		U
Uranium 235	15117-96-1	~~0.038~~	~~0.050~~	0.1	0.3	U	U
Uranium 238		0.64	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	2.0	0.35	0.03	0.1		U_T
Neptunium 237	13994-20-2	0.007	0.010	0	0.2	~~J~~	NP
Plutonium 238	13981-16-3	~~0.006~~	~~0.016~~	0.04	0.05	U	PU
Plutonium 239/240		~~0.008~~	~~0.012~~	0.02	0.05	U	PU
Americium 241	14596-10-2	~~0.007~~	~~0.014~~	0.05	0.05	U	TP
Curium 244	13981-15-2	~~0~~	~~0.014~~	0.05	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.05		U	GAM
Potassium 40	13966-00-2	12	0.83				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.1	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.06	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.04	0.05	U	GAM
Niobium 94	14681-63-1	U		0.04		U	GAM
Ruthenium 103	13968-53-1	U		0.5		U	GAM
Ruthenium 106	13967-48-1	U		2		U	GAM
Tin 113	13966-06-8	U		0.5		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	320	1.0		0.05	J	GAM

Verified 4-4-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

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TMA NORCAL
REPORTING GROUP 7296

N311062-06

DATA SHEET, cont

B09DP0

SDG	7296	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311062-06	Client sample id	B09DP0
Dept sample id	7296-006	Location/Matrix	200-UP-2 SOLID
Received	11/10/93	Collected	11/05/93
% moisture	3.9	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		0.6	0.1	U	GAM
Europium 154	15585-10-1	U		0.4	0.1	U	GAM
Europium 155	14391-16-3	U		0.8	0.1	U	GAM
Radium 226	13982-63-3	0.69	0.25				GAM
Radium 228	15262-20-1	0.75	0.18				GAM
Thorium 228	14274-82-9	1.0	0.32			J	GAM
Thorium 232	7440-29-1	0.75	0.18				GAM

RS Verified 4-4-94

DATA SHEETS
Page 7
SUMMARY DATA SECTION
Page 23

RS 4-4-94

31

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/20/94

9713505.2233

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

TMA/Norcal

Report N3-11-062-7296
Sample Delivery Group 7296

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative **January 20, 1994**

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7296 is comprised of the six soil samples from location 200-UP-2, delivered under Field Log Book #EFL-1091. Chain-of-Custody numbers were not provided.

One 1000 mL plastic bottle containing each sample was received for analysis. Inadequate volumes were received to meet gamma scan RDL's for the duplicate of sample BO9DP0.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

The relative percent difference (RPD) between sample BO9DP0 and its duplicate is slightly above the 3 σ contractual limit of 33%. The samples were recounted and the results did not improve. The sample inhomogeneity is suspected.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

Standardization solutions of selenium-79 are not available commercially for calibration of this analysis. LSC instrument efficiency must be determined using carbon-14, which has a decay scheme and beta energy spectrum very similar to those of selenium-79.

The analysis begins with the addition of stable selenium carrier to the sample and proceeds with appropriate separation and purification chemistry to isolate the selenium. The chemical recovery is gravimetrically determined by weighing the recovered carrier. The selenium is then prepared for LSC counting by combining it with a fluor in a scintillation vial. Instrument background is determined by preparing and counting a matched vial with carrier but no activity.

After the initial sample count, the vial is opened and spiked with a known amount of traceable carbon-14 activity and recounted. The counting efficiency is then determined from the combined data from both counts.

Since selenium-79 activity is not available and carbon-14 surrogate activity will not follow through the selenium purification chemistry, it is not possible to process a laboratory control sample. The QC samples will therefore consist of blanks and duplicates only.

4 RS 4-4-94

2.0 ANALYSIS NOTES (con't.)

2.4 Strontium-90 Analyses

No problems were encountered by the laboratory in the analyses.

2.5 Technetium-99 Analyses

No problems were encountered by the laboratory in the analyses.

2.6 Iodine-129 Analyses

The recovery of iodine-129 in the laboratory control sample is 124% which is outside both the 3 σ protocol limits and the contractual limits of (80-120)%. No cause could be determined for the low recovery.

2.7 Neptunium-237 Analyses

Low recoveries were observed during the initial analysis and the sample was reanalyzed QC samples 7296-012 and 7296-013. The sample and the QC associated with the sample were counted for less than the nominal count time of 100 minutes. MDA's met the RDL despite the reduced count time.

2.8 Total Uranium Analyses

No problems were encountered by the laboratory in the analyses.

2.9 Isotopic Uranium Analyses

The count time for sample BO9DP0, the blank, and the laboratory control sample were less than the nominal count time of 150 minutes. The MDA's meet the RDL despite this.

2.10 Isotopic Plutonium Analyses

The plutonium-238 MDA in the duplicate of sample BO9DP0 is higher than the RDL due to higher detector background in the region of interest.

2.11 Americium-241/Curium-244 Analyses

No problems were encountered by the laboratory in the analyses.

4-4-94

5

TMA/Norcal
Report N3-11-062-7296
Sample Delivery Group 7296

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

January 20, 1994

2.12 Gamma Scan Analyses

The MDA's of several gamma nuclides for the duplicate analyses of sample B09DP0 are higher than the RDL's due to the smaller than nominal aliquot available for analysis. The MDA's of iron-59, cobalt-58, europium-152, 154, and 155 in the original of sample BO9DP0 are higher than the RDL's due to the shorter half-lives of the nuclides and, in some cases, due to higher background of the detector in the region of interest. The relative percent difference of cesium-137 in the sample and its duplicate is above the contractual limit of 33%. The sample inhomogeneity is suspected.

4-4-94

9713505.2237

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / JG HOGAN

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 11-5-93

Ice Chest No.: SML 55A

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: HMSR 17891

Offsite Property No.:

Method of Shipment: AIR

Shipped to: TMA

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

Sample Identification

1) B09DP0

~~1~~,250ml P:CLP;TAL Metals,Hg,Ti
~~1~~,250ml Gs:VOA CLP
~~1~~,250ml aG:Semi-VOA CLP
~~1~~,125ml G:Anions F,Cl,SO4 (EPA 300.0)
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,125ml G:Cyanide CLP
~~1~~,125ml Gw:Kerosene (8015M)
~~1~~,1000ml P/G:Gross alpha/beta (EP-10), 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 11-5-93

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: JG HOGAN / JG Hogan	Received by: W.U. Setzer / W.U. SETZER	Date/Time: 11-9-93 1115
Relinquished by: W.U. Setzer	Received by: / H. NARCISO	Date/Time: 11-10-93 10:22
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

~~80~~ 4-4-94

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

9213505.2238

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: 10-29-93

Ice Chest No.: SML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351

Offsite Property No.: ~~WHH-0-0009-41~~

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09904
~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3)
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E. Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

~~72~~ 4-4-94

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

9713585.2239

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: 11-1-93

Ice Chest No.: SML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351

Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE JER 11-8-93

Shipped to: TMA

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

Sample Identification

1) B09905
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
- 1,1000ml P/G:Gross beta (EP-10), ~~Total Uranium~~ (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3)
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

JER 11-1-93

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

Relinquished by:	Received by:	Date/Time:
1045 Clarence E. Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

4-4-94

~~74~~

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

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: 11-1-93

Ice Chest No.: JML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351 LER 11-8-93

Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09906

~~1~~,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1~~,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ LER 11-1-93
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),~~Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
1045 Lorene E. Rogers 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

4-4-94

~~76~~

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

9213505.2241

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: 11-2-93

Ice Chest No.: SML-353

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: 2519010351 JER 11-8-93

Offsite Property No.: W94-0-0009-41

Method of Shipment: ~~OVERNIGHT~~ AIR SERVICE

Shipped to: TMA

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

Sample Identification

1) B09907
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B09908
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ JER 11-2-93
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
Loren E. Rogers 1045 11-8-93	K. Blum Kermit Blum	11-9-93 1145
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:

RE 4-4-94

~~78~~

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200 UP-2	DATA PACKAGE: B09904-TMA-644
VALIDATOR: T. Stapp / LAB: WESTON ANALYTICAL	DATE: 3-29-94
CASE:	SDG:

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☑ ~~Tritium~~ SELENIUM	☑ IODINE-129	☑ NEPTUNIUM	

SAMPLES/MATRIX B09904, B09905, B09906, B09907, B09908, B09DP0 / SOIL

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . Yes (No) N/A

Comments: Performed by WHC & Forms are not required to proceed with validation task.

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:

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . (Yes) No N/A
Calibration check acceptable? . . . NOTE ① . . . . . (Yes) No N/A
Calibration check standards NIST traceable? . . . . . (Yes) No N/A
Calibration check standards expired? . . . . . Yes (No) N/A

Comments: ① Current detector control charts were not available for the month in which sample analysis was performed. Calibration check results were compared to the previous most recent checks and results were acceptable, therefore no qualification was applied for technetium-99 analysis on detectors LGB-10, -11, -12, and -15.

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . (Yes) No N/A
Analytes detected in method blank? . . . . . Yes (No) N/A
Field blank(s) analyzed? . . . 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 is not identified with this sample set, but it has been requested. Field QC will be evaluated with the final data summary.

5. Matrix Spikes . . . . . SEE NOTE ① . . . . . (☐ 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: ① Matrix Spike analysis is not required since LCS data is present.

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments:

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . NOTE ① . . . . . Yes No N/A
RPD Values Acceptable? . . NOTE ② . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: ① Duplicate analysis for Gamma Spect. analytes was performed on different geometry (Jar) than other QC and samples (Marinelli). No qualification applied.
② RPD of Cs-137 and Th-228 exceed the 35% limit for soils as indicated with qualification on form B-5.

9. Field QC Samples . . . SEE 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 samples have not been identified with this sample set, but the information has been requested. Field QC will be evaluated in the final data Summary.

10. Holding Times

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: See HOLD TIME Summary page B-1.

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? . . SEE NOTE ④ on page A-5. . . . . Yes No N/A
Transcription/Calculation errors? . NOTE ① . . . . . Yes No N/A
MDA's meet required detection limits? . NOTE ② . . . . . Yes No N/A
Transcription/calculation errors? . . NOTE ③ . . . . . Yes No N/A

Comments: ① Gross α amount for BØ9DPØ has been changed on the Lab report form. ② MDAs for Fe-59 Co-58, and Eu-152,-154,-155 were reported above the RDL for Sample BØ9DPØ as indicated in the laboratory narrative. ③ MDA values were not verified by recalculation for samples with associated results as follows: Se-79, Sr-90, Isotopic Uranium, plutonium, curium, ~~ame~~ neptunium and Iodine. Differences may be attributable to Statistical treatment of data at the laboratory and was not available at the time of verification. No qualification of data is required.

4-25-94

(Revised 4-25-94 030)

Comments:

Continuation of Item # 11 : (page A-4)

Note (4) Laboratory applied qualifiers as seen on laboratory report forms (Attachment 3), have been crossed out during validation since they do not apply to normal validation procedures as outlined by WHC. Where appropriate, new qualifiers have been applied or, the qualification column has been left blank (ie, no qualifiers).

TC 4-25-94

4-25-94
Revised TC
030A

HOLDING TIME SUMMARY

SDG: B09904-TMA-644	VALIDATOR: T. Stapp	DATE: 3-29-94	PAGE 1 OF 2
COMMENTS: RADIOCHEMISTRY			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09904	Grs α/β	10-29-93	N/A	12-14-93	N/A	≤180	NONE
	Tc-99			12-23-93			
	U isotopic			12-28-93			
	Total U			12-21-93			
B09905	Grs α/β	11-1-93		12-14-93			
	Tc-99			12-23			
	U isotopic			12-28			
	Total U			12-21			
B09906	Grs α/β	11-1-93		12-14-93			
	Tc-99			12-23-93			
	U isotopic			12-13-94			
	Total U			12-21-93			
B09907	Grs α/β	11-2-93		12-14-93			
	Tc-99			12-29-93			
	U isotopic			12-28-93			
	Total U			12-21-93			

TS 4-25-94

4-25-94 Revised TS

9713505.2248
WHC-SD-EN-SPP-002, Rev. 2

HOLDING TIME SUMMARY

SDG: B09904-TMA-644 VALIDATOR: T. Stapp DATE: 3-29-94 PAGE 2 OF 2

COMMENTS: RADIOCHEMISTRY

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09908	Grs α β	11-2-93	N/A	12-14-93	N/A	≤ 180	NONE
	Tc-99			12-14-93			
	U isotopic			12-28-93			
	Total U			12-21-93			
B09DP0	Grs α β	11-5-93		1-17-94			
	Gamma			12-09-93			
	I-129			12-14-93			
	Np-			1-07-94			
	Am, Cm			12-17-93			
	U isotopic			1-07-94			
	Total U			12-21-93			
	Sr-90			12-11-93			
	Tc-99			12-23-93			
	Se			1-06-94			
	Pu isotopic			12-18-93			
N/A							
N/A							

4-25-94

B-1

Revised 4-25-94 032

3-29-92

9713505.2249

WHC-SD-EN-SPP-002, Rev. 2

B09904-TMA-644

PRECISION DATA SUMMARY

SDG:	VALIDATOR: T. Stapp	DATE: 3-31-94	PAGE 1 OF 1

COMMENTS:

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Cesium-137	B09DP0	Duplicate	46	B09DP0	J ~~UJ~~ 4-4-94
Thorium-228	"	"	61	"	J ~~UJ~~ 4-4-94

9413505.2250

WHC-SD-EN-SPP-002, Rev. 2

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Gross Alpha/Beta									
Sample ID	B09904	B09905	B09906	B09907	B09908	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	109	111	113	115	116	106	109	110	115
Aliquot	0.10	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	100
Alpha cpm	0.22	0.31	0.40	0.43	0.32	0.53	5.68	0.05	0.79
Alpha, Bkgd	0.06	0.11	0.07	0.11	0.06	0.07	0.057	0.038	0.116
Alpha, Xtalk	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff	0.127	0.134	0.144	0.164	0.163	0.127	0.115	0.114	0.135
Alpha Result Calc.	5.56	6.31	9.83	8.55	6.83	9.22	215.06	0.45	12.97
Alpha Result Rptd.	5.60	6.30	9.80	8.50	6.80	9.00	220	0.46	13
Alpha MDA Calc.	3.91	5.27	3.86	4.21	3.21	4.34	4.36	3.59	5.30
Alpha MDA Rptd.	4	5	4	4	3	4	4	4	5
Beta cpm	2.29	2.66	3.68	2.86	3.01	35.17	24.69	1.39	49.2
Bkgd	1.05	1.05	1.00	0.98	1.12	1.61	1.052	1.266	1.552
Xtalk	0.274	0.270	0.264	0.254	0.255	0.275	0.281	0.281	0.269
Eff	0.42	0.42	0.42	0.42	0.42	0.42	0.416	0.416	0.42
Beta Result Calc.	12.91	16.66	27.78	19.17	19.41	360.34	238.82	1.31	509.08
Beta Result Rptd	13	17	28	19	19	360	240	1.3	510
Beta MDA Calc	5.14	5.13	4.98	4.91	5.25	6.36	5.18	5.68	6.23
Beta MDA rptd	5	5	5	5	5	6	5	6	6

-034

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Selenium 79			
Sample ID	B09DP0	QC-BLANK	B09DP0-DUP
Detector	4	4	4
Gross Counts	1675	1725	1736
Count Time	150	150	150
Sample Amount	0.52	1	0.53
Bkgd cpm	11.14	11.02	11.16
Decay Factor	1	1	1
Detector Eff.	0.728	0.727	0.768
Yield	0.6739	0.7259	0.7957
Result Calc.	0.047	0.41	0.57
Result Rptd	0.028	0.39	0.57
MDA Calc.	2.24	1.08	1.77
MDA Rptd.	2.00	2.00	2.00

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Strontium 90				
Sample ID	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	GRB201	GRB202	GRB203	GRB204
Bkg	0.4418	0.4077	0.4254	0.4255
Count Time	33.000	33.000	33.000	33.000
Y90 cpm	42.988	11.127	0.030	44.405
Elapsed Time, days	35.425	0.000	0.000	35.425
Lambda	6.86E-05	6.86E-05	6.86E-05	6.86E-05
Decay	0.9976	1.0000	1.0000	0.9976
Yield	0.8609	0.8918	0.9005	0.8723
PPT. corr.	1	1	1	1
Aliquot	1	1	1	1
Product	0.8588	0.8918	0.9005	0.8702
C-zero	50.0553	12.4770	0.0333	51.0296
P-Factor	1.859	1.859	1.859	1.859
Result, calc.	41.916	10.448	0.028	42.732
Result, rptd.	42.000	10.000	0.028	43.000
MDA, calc.	0.861	0.859	0.886	0.856
MDA, rptd.	0.800	0.800	0.800	0.700

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036

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Technetium 99									
Sample ID	B09904	B09905	B09906	B09907	B09908	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	LBG 10	LBG 11	LBG 12	LBG 11	LBG 12	LBG 15	LBG 16	LBG 13	LBG 11
Aliquot	2.030	2.030	2.060	2.040	2.050	2.020	2	2	2.06
P-Factor	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Yield	0.397	0.426	0.382	0.539	0.478	0.473	0.4209	0.6113	0.4239
Days	55.616	52.574	52.574	51.574	56.421	48.574	0	0	53.498
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	8.91E-09
Decay	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net, cpm	0.270	0.480	0.740	0.120	0.090	0.170	18.200	0.160	0.200
Count, time	132.200	132.200	132.200	132.200	105.100	118.100	132.200	176.800	134.800
Bkg., cpm	0.540	0.500	0.570	0.470	0.590	0.575	0.52	0.47	0.52
Result, calc.	0.354	0.585	0.993	0.115	0.097	0.187	22.789	0.138	0.241
Result, rptd.	0.360	0.590	1.000	0.110	0.099	0.180	23	0.13	0.24
MDA, calc.	0.390	0.349	0.410	0.266	0.375	0.358	0.366	0.207	0.349
MDA, rptd.	0.400	0.400	0.400	0.300	0.300	0.400	0.4	0.2	0.3

037

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Total Uranium	Standard	Intensity			Calc	UG/L	Prep/Dsvl	Final	Rptd
	0.049	402	Sample ID	Intens.	Result		Volume	Rslt	Rslt
	0.156	1182	B09904	27992	3.5	37.9	0.08	3.0	3.0
	0.521	4187	B09905	13039	1.6	17.6	0.08	1.4	1.4
	0.976	7921	B09906	26293	3.3	35.9	0.08	2.9	2.9
	2.603	20934	B09907	15628	2.0	21	0.08	1.7	1.7
	4.831	38734	B09908	11193	1.4	14.8	0.08	1.2	1.2
	16.27	121703	B09DP0	18497	2.3	25.1	0.08	2.0	2.0
			QC-LCS	26429	3.3	32.5	0.08	2.6	2.6
			QC-BLANK	-483	-0.1	0	0.08	0.0	0.0
			B09DP0-DU	22667	2.9	31.1	0.08	2.5	2.5
Slope:	1.3E-04								

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Uranium 233/4/5/8									
Sample ID	B09904	B09905	B09906	B09907	B09908	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	25	26	23	25	26	28	29	30	24
Sample count time	400.02	400.02	527.93	201.48	201.48	149.05	149.05	149.05	313.7
Corr. tracer dpm	10.47	10.47	10.46	10.47	10.47	10.46	10.46	10.46	10.47
Bkgd count time	6481.67	6481.67	790.67	6481.67	6481.67	6227.63	6227.63	6227.63	1132.27
Net tracer counts	765	510	1298	494	416	454	475	362	729
Detector eff.	0.3135	0.2822	0.3001	0.3135	0.2822	0.3894	0.3868	0.3674	0.3157
Yield	0.5826	0.4315	0.7833	0.7470	0.6988	0.7478	0.7877	0.6320	0.7031
Aliquot	1	1	1	1	1	1	1	1	1
U-238, gross counts	176	55	212	62	35	62	545	1	125
U-238, bkgd counts	2	1	2	1	0	0	33	0	2
U-235, gross counts	10	1	15	3	1	3	331	1	14
U-235, bkgd counts	1	1	1	1	0	0	0	0	1
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	189	62	226	63	37	67	502	1	127
U-233/4, bkgd counts	5	4	6	2	2	0	36	0	5
U-238, result calc.	1.073	0.499	0.762	0.582	0.397	0.643	5.079	0.013	0.80
U-238, result rptd	1.100	0.500	0.760	0.580	0.400	0.640	5.100	0.013	0.80
U-238 MDA calc.	0.047	0.071	0.028	0.073	0.087	0.080	0.266	0.100	0.05
U-238, MDA rptd.	0.060	0.070	0.030	0.070	0.090	0.080	0.300	0.100	0.06
U-235, result calc.	0.067	0.000	0.062	0.023	0.014	0.038	3.975	0.016	0.10
U-235, result rptd.	0.067	0.000	0.057	0.023	0.014	0.038	4.000	0.016	0.10
U-235, MDA calc.	0.057	0.086	0.034	0.089	0.105	0.096	0.092	0.121	0.06
U-235, MDA rptd.	0.060	0.090	0.030	0.090	0.100	0.100	0.090	0.100	0.06
U-233/4, result calc.	1.134	0.536	0.799	0.582	0.397	0.695	4.622	0.013	0.79
U-233/4, result rptd.	1.100	0.530	0.790	0.570	0.390	0.690	4.600	0.000	0.78
U-233/4, MDA calc.	0.064	0.086	0.041	0.073	0.087	0.080	0.277	0.100	0.07
U-233/4, MDA rptd.	0.080	0.100	0.050	0.090	0.100	0.080	0.300	0.100	0.09

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039

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Plutonium 238/239				
Sample ID	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	40	41	42	43
Count time	1277.3	1277.3	1277.3	1275.5
Corr, tracer dpm	4.86	4.86	4.86	4.86
Bkgd, count time	2375.67	2375.67	2375.67	2382.02
Net, tracer counts	1072	1387	1163	625
Detector Eff	0.4138	0.4063	0.3937	0.3688
Yield	0.417	0.550	0.476	0.273
Aliquot	1	1	1	1
Pu239, gross counts	7	664	4	8
Pu239, bkgd counts	3	2	3	2
Pu239 decay	1	1	1	1
Pu238, gross counts	0	20	23	17
Pu238, bkgd counts	11	11	14	12
Pu238 decay	0.999	1	1	1
Pu239, Result calc.	0.008	1.045	0.002	0.021
Pu239, Result rptd	0.008	1.000	0.002	0.021
Pu239, MDA calc.	0.016	0.012	0.015	0.027
Pu239, MDA rptd.	0.020	0.020	0.020	0.030
Pu238, Result calc.	-0.022	0.014	0.017	0.018
Pu238, Result rptd.	-0.006	0.014	0.017	0.018
Pu238, MDA calc.	0.032	0.024	0.033	0.057
Pu238, MDA rptd	0.040	0.030	0.040	0.070

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Americium/Curium				
Sample ID	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	63	64	65	66
Count Time	731.52	731.52	731.52	731.52
Tracer dpm	4.95	4.95	4.95	4.95
Bkgd count time	2380.13	2380.13	2380.13	2380.13
Net tracer counts	326	694	1086	613
Detector eff.	0.4006	0.4031	0.409	0.4068
Yield	0.225	0.475	0.733	0.416
Aliquot	1	1	1	1
Am241 gross counts	1	353	2	6
Am241 bkgd. counts	1	0	1	2
Am241 decay	0.9998	1	1	0.9998
Cm244 gross counts	0	231	1	1
Cm244 bkgd counts	0	1	1	2
Cm244 decay	0.9955	1	1	0.9955
Am241 result calc.	0.000	1.134	0.002	0.015
Am241 result rptd.	-0.007	1.132	-0.002	0.011
Am241 MDA calc.	0.052	0.025	0.016	0.028
Am241 MDA rptd	0.050	0.020	0.020	0.030
Cm244 result calc.	0.000	0.739	0.000	-0.004
Cm244 result rptd	0.000	0.740	-0.002	-0.004
Cm244 MDA calc.	0.053	0.025	0.016	0.028
Cm244 MDA rptd.	0.050	0.020	0.020	0.040

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SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Neptunium				
Sample ID	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	28	30	54	29
Np239 cpm	35.24	38.55	21.52	33.78
Inst. eff.	0.721	0.721	0.721	0.721
Am243 added	99.08	99.08	99.08	99.08
Yield	0.4933	0.5396	0.3012	0.4729
Aliquot	1.000	1.000	1.000	1.000
Count time	976.87	976.87	1015.03	976.87
Np237 gross counts	4	1602	2	2
Np237 bkgd counts	1	1	0	1
Np237 aspec. eff	0.389	0.367	0.37	0.387
Np237 result calc.	0.007	3.728	0.008	0.003
Np237 result rptd.	0.007	3.700	0.008	0.003
Np237 MDA calc.	0.018	0.018	0.031	0.019
Np237 MDA rptd.	0.000	0.000	0.010	0.000

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042

SAMPLE RESULT VERIFICATION, DATA PACKAGE: B09904-TMA-644

Iodine-129				
Sample ID	B09DP0	QC-LCS	QC-BLANK	B09DP0-DUP
Detector	XSPEC14	XSPEC14	XSPEC14	XSPEC14
Count Time	684.45	238.67	409.35	555.6
Gross cpm	0.558	22.831	0.507	0.418
Bkg cpm	0.616	0.824	0.627	0.487
Blank cpm	-0.088	-0.117	-0.088	-0.088
Net cpm	0.03	22.124	-0.036	0.081
Lambda	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Corr. Days	39.91	0.00	0.00	43.00
Decay	1	1	1	1
Yield	0.7539	0.8763	0.864	0.6334
Aliquot	1.04	1	1	1.04
PPT. Corr.	1	1	1	1
Product	7.84E-01	8.76E-01	8.64E-01	6.59E-01
P-factor	4.57	4.57	4.57	4.57
Result Calc.	0.079	51.973	-0.086	0.253
Result Rptd.	0.078	52.000	-0.085	0.250
MDA Calc.	0.367	0.643	0.435	0.431
MDA Rptd.	1.000	2.000	1.000	2.000

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043