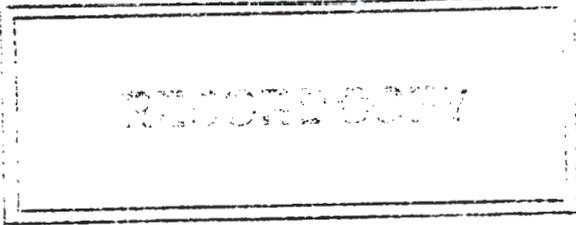


START 9713512.1805

B09847-TMA-628

0046098

TMA
A362



WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:



ORGANICS & GENERAL CHEMISTRY
Case No. 10-014
(TMA/ARLI Work Order # A3-10-014)

METALS & NITRATE/NITRITE
Case No. N3-10-030
(TMA/Skinner & Sherman W.O. # S3-10-097 & S3-10-098)

December 15, 1993

TMA Master Work Order # N3-10-030

i 7/9/96 Kdb

9713512.1806

PAGE 1

TMA/Norcal

CHAIN OF CUSTODY

ORD # N3-10-030

000002

RCVD: 10/09/93 DUE: 11/15/93

10/11/93 13:42:32

KEEP: 11/15/94 DISP: S

DASH SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY
01A-S B098Y7	ARLI	: WH014 WH015 WH016 WH195 WH232
01C-S B098Y7 MS	ARLI	: WH014 WH015 WH016 WH195 WH232
01D-S B098Y7 MSD	ARLI	: WH014 WH015 WH016 WH195
01E-S B098Y7 DUP	ARLI	: WH232

03A-S B098Y9	ARLI	: WH014

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
<i>Pat M. Lando</i>	<i>10-11-93</i>			<i>C. Haws</i>	<i>10/12/93</i>

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 10-7-93

Ice Chest No. 5ML-S4B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) GER 10-7-93 BO98Y7
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml aG:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,S04 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 aG PCB/Pest
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml Gs:VOA CLP
 - 1,250ml aG:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,S04 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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) GER 10-7-93
- 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,S04 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>10-8-93</u> <u>Coren E. Rogers 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1122</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. NATCISO</u> <u>JG HOGAN TMA/NORCAL</u>	Date/Time: <u>10-11-93 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
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Comments:

Rec'd SATURDAY 10-9-93 OPENED 10/11/93

9713512.1889

000002c

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-8-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

1) B09849

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

SR 10-8-93

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 (8015H)~~
- ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>L E ROGERS</u> <u>10-8-93</u> <u>1120</u>	Received by: <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1120</u>
Relinquished by: <u>JG HOGAN</u> <u>10-8-93 / 1135</u>	Received by: <u>H. NARCISO</u>	Date/Time: <u>10-11-93 / 8:00</u>
Relinquished by: _____	Received by: _____	Date/Time: _____
Relinquished by: _____	Received by: _____	Date/Time: _____

Final Sample Disposition

Disposal Method: _____ Disposed by: _____ Date/Time: _____

Comments:

Rec'd 10-9-93 TMA/NORCAL OPENED 10/11/93

9713512.1810

0000026

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

Collector L E ROGERS
Company Contact L E ROGERS

S.A.F. # 93-263

Date 10-8-93

Telephone (509) 376-7690

Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
809849	5 10-8-93	0700	 1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml nG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015H) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79
			 1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml nG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015H) 1,1000ml P/G:Gross alpha/beta (EP-10), 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
	SEP 10-8-93		 1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml nG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015H) 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30),TotalUranium(EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79

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

Field Information TMA
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards NONE NOTED

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 10-7-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) 809818
 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) SEP 10-8-93
 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)~~

Field Transfer of Custody

Chain of Possession

(Sign and Print Names)

Relinquished by: 10-8-93
Roger E. Rogers 1120

Received by: JG HOGAN
JG HOGAN

Date/Time:
10-8-93 / 1120

Relinquished by: JG HOGAN
JG HOGAN 10-8-93 / 1135

Received by: H. NARCISO
H. NARCISO TMA/NORCAL

Date/Time:
10-11-93 / 8:00

Relinquished by:

Received by:

Date/Time:

Relinquished by:

Received by:

Date/Time:

Final Sample Disposition

Disposal Method:

Disposed by:

Date/Time:

Comments:

Rec'd SATURDAY 10-9-93 . OPENED 10-11-93

9713512.1812

000002F

Westinghouse Hanford Company		SAMPLE ANALYSIS REQUEST			
Collector L E ROGERS		S.A.F. # 93-263		Date 10-7-93	
Company Contact L E ROGERS		Rev 2		Telephone (509) 376-7690	
Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required	
B09848	S	10-7-93	1300	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)	
		10-8-93		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)	
<p>*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other</p> <p> DL = Drum Liquids O = Oil SL = Sludge W = Water</p> <p> DS = Drum Solids S = Soil SO = Solid WI = Wipe</p>					
Field Information TMA					
Special Handling and/or Storage Maintain at 4C ; (SOIL)					
Possible Sample Hazards NONE NOTED					

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241
Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball 
HASM Project Coordinator (Print/Sign Name)

11-4-93
Date

Mark Wasemiller 
Technical Representative (Print/Sign Name)

11/12/93
Date

N/A
Quality Assurance (Print/Sign Name)

Date

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARLI

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): D. WHITAKER

LOG-IN-DATE : 10-12-93

RECEIVED BY (SIGNATURE): *D. Whitaker*

ICE CHEST NO. <u>1982</u>	CORRESPONDING			REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	
REMARKS:				
1. Custody Seal(s) <u>Present / Intact</u> / Absent* / Broken		B098Y9	A310014	
2. Custody Seal Nos:		B098Y7	A310014	
3. Chain of Custody Records <u>Present / Absent*</u>		B099K5	A310013	
4. Traffic Reports or Packing List <u>Present / Absent*</u>		B099L5	A310013	
5. Airbill <u>Airbill / Sticker Present / Absent*</u>		B099K9	A310013	
6. Airbill No.: <u>7289153594</u>				
7. Sample Tags <u>Present / Absent*</u>				
8. Sample Tag Numbers <u>Listed / Not Listed on Chain of Custody</u>				
9. Sample Conditions: <u>Intact / Broken* / Leaking</u>				
10. Does information on custody records, traffic reports, and sample tags agree? <u>Yes / No*</u>				
11. Date Received at Lab: <u>10-12-93</u>				
12. Temp of Ice chest: <u>3</u> °C				
13. Time Received: <u>0930</u>				
SAMPLE TRANSFER				
Fraction: _____				
Area #: _____				
By: _____				
On: _____				

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: _____

Date: _____ Logbook Page No.: _____

000004



QUESTIONS? CALL 800-238-5355 TOLL FREE.

PACKAGE TRACKING NUMBER

7289153594

7289153594

RECIPIENT'S COPY

From (Your Name) Please Print SAMPLE CONTROL		Your Phone Number (Very Important) (818) 357-3247		To (Recipient's Name) Please Print CAROLE HARRIS		Recipient's Phone Number (Very Important) (818) 357-3247			
Company SAMPLE CONTROL		Department/Floor No. 2		Company TMA/ARLI		Department/Floor No.			
Street Address 160 TAYLOR STREET				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.) 160 TAYLOR STREET					
City MONROVIA,		State CA.		City MONROVIA,		State CA.			
ZIP Required 91016		ZIP Required 91016		ZIP Required 91016		ZIP Required 91016			
YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.) 2340-6406				IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required					
PAYMENT <input checked="" type="checkbox"/> Bill Sender <input type="checkbox"/> Bill Recipient's FedEx Acct. No. <input type="checkbox"/> Bill 3rd Party FedEx Acct. No. <input type="checkbox"/> Bill Credit Card									
<input type="checkbox"/> Cash <input type="checkbox"/> Check									
4 SERVICES (Check only one box)		5 DELIVERY AND SPECIAL HANDLING (Check services required)		6 PACKAGES		WEIGHT IN POUNDS OZ			
Priority Overnight (Delivery by next business morning) 11 <input checked="" type="checkbox"/> OTHER PACKAGING 12 <input type="checkbox"/> FEDEX LETTER* 16 <input type="checkbox"/> FEDEX PAK* 13 <input type="checkbox"/> FEDEX BOX 14 <input type="checkbox"/> FEDEX TUBE Economy Two-Day (Delivery by second business day) 30 <input type="checkbox"/> ECONOMY* *Economy Letter rate not available. Minimum charge. One pound economy rate. 70 <input type="checkbox"/> OVERNIGHT FREIGHT** (Confirmed reservation required)		Standard Overnight (Delivery by next business afternoon to Saturday delivery) 51 <input type="checkbox"/> OTHER PACKAGING 56 <input type="checkbox"/> FEDEX LETTER* 52 <input type="checkbox"/> FEDEX PAK* 53 <input type="checkbox"/> FEDEX BOX 54 <input type="checkbox"/> FEDEX TUBE Government Overnight (Restricted for authorized users only) 46 <input type="checkbox"/> GOV'T LETTER 41 <input type="checkbox"/> GOV'T PACKAGE Freight Service (for packages over 150 lbs.) 80 <input type="checkbox"/> TWO-DAY FREIGHT** (Confirmed reservation required)		1 <input type="checkbox"/> HOLD FOR PICK-UP (Fill in Box #) 2 <input checked="" type="checkbox"/> DELIVER WEEKDAY 3 <input type="checkbox"/> DELIVER SATURDAY (Extra charge) (Not available to all locations) 4 <input type="checkbox"/> DANGEROUS GOODS (Extra charge) 5 <input type="checkbox"/> 6 <input type="checkbox"/> DRY ICE (Dangerous Goods Shipper's Declaration not required) Dry Ice & UN 1845 <input type="checkbox"/> kg. <input type="checkbox"/> lbs. <input type="checkbox"/> DIM SHIPMENT (Chargeable Weight) 7 <input type="checkbox"/> OTHER SPECIAL SERVICE 8 <input type="checkbox"/> 9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge) 12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		Total Total Total 1-42 L x W x H Received At <input checked="" type="checkbox"/> Regular Stop <input type="checkbox"/> Drop Box <input type="checkbox"/> On-Call Stop <input type="checkbox"/> Station		Emp. No. Date <input type="checkbox"/> Cash Received <input type="checkbox"/> Return Shipment <input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold Street Address City State Zip Received By: X Date/Time Received FedEx Employee Number Federal Express Use: Base Charges Declared Value Charge Other 1 Other 2 Total Charges REVISION DATE 11/92 PART #137204 FXEM 3/93 FORMAT #155 155 © 1992-93 FEDEX PRINTED IN U.S.A.	

97352.815

GENERAL CHEMISTRY RESULTS

CASE NO. 10-014

Soil Sample #:

B098Y7

B098Y9

CASE NARRATIVE

Sample B098Y7 did not exhibit homogeneity. Therefore, the percent RPD for Fluoride was 24.6%.

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

Maureen Parrish 12/9/93

Maureen Parrish

9713512.1818

000009

TMA Inc.

REPORT

Work Order # A3-10-014

Received: 10/11/93

Results by Sample

SAMPLE ID B098Y7

FRACTION 01E

TEST CODE WCCLPS

NAME Anions in Solids

Date & Time Collected 10/07/93

Category _____

ANIONS AND WET CHEMISTRY - SOLIDS				
<u>ANALYSIS</u>	<u>METHOD</u>	<u>RESULT</u>	<u>UNITS</u>	<u>LIMIT</u>
Chloride	300.0	6.0	mg/kg	1.0
Fluoride	300.0	3.2	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

FORM 1

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

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

2.0 SAMPLE LIST :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

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

Nicole Roth

Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish

Maureen Parrish 12/14/93
Program Manager

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI Contract: WHC
 Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA
 Matrix: (soil/water) SOIL Lab Sample ID: A310014-01A
 Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31020R08
 Level: (low/med) LOW Date Received: 10/11/93
 % Moisture: not dec. 8 Date Analyzed: 10/20/93
 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) <u>UG/KG</u>	Q
74-87-3	-----Chloromethane	11	U
74-83-9	-----Bromomethane	11	U
75-01-4	-----Vinyl Chloride	11	U
75-00-3	-----Chloroethane	11	U
75-09-2	-----Methylene Chloride	11	U
67-64-1	-----Acetone	11	U
75-15-0	-----Carbon Disulfide	11	U
75-35-4	-----1,1-Dichloroethene	11	U
75-34-3	-----1,1-Dichloroethane	11	U
540-59-0	-----1,2-Dichloroethene (total)	11	U
67-66-3	-----Chloroform	11	U
107-06-2	-----1,2-Dichloroethane	11	U
78-93-3	-----2-Butanone	11	U
71-55-6	-----1,1,1-Trichloroethane	11	U
56-23-5	-----Carbon Tetrachloride	11	U
75-27-4	-----Bromodichloromethane	11	U
78-87-5	-----1,2-Dichloropropane	11	U
10061-01-5	-----cis-1,3-Dichloropropene	11	U
79-01-6	-----Trichloroethene	11	U
124-48-1	-----Dibromochloromethane	11	U
79-00-5	-----1,1,2-Trichloroethane	11	U
71-43-2	-----Benzene	11	U
10061-02-6	-----trans-1,3-Dichloropropene	11	U
75-25-2	-----Bromoform	11	U
108-10-1	-----4-Methyl-2-Pentanone	11	U
591-78-6	-----2-Hexanone	11	U
127-18-4	-----Tetrachloroethene	11	U
79-34-5	-----1,1,2,2-Tetrachloroethane	11	U
108-88-3	-----Toluene	11	U
108-90-7	-----Chlorobenzene	11	U
100-41-4	-----Ethylbenzene	11	U
100-42-5	-----Styrene	11	U
1330-20-7	-----Xylene (total)	11	U

9713512.1824

000077

EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31020R08

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

% Moisture: not dec. 8 Date Analyzed: 10/20/93

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

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

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

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

9713512.1825

000078

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

B098Y9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31020R03

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

% Moisture: not dec. 0 Date Analyzed: 10/20/93

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) <u>UG/KG</u>		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	U	
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	

9713512.1826

1E

000079

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B098Y9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31020R03

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

% Moisture: not dec. 0 Date Analyzed: 10/20/93

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

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	28.08	10	J

9713512.1827

000080

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03

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

% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.6

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl) Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	860	U

9713512.1828

000081

1C

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03

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

% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	230	BJ
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
117-81-7	bis(2-Ethylhexyl) Phthalate	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

9713512.1829

000082

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03

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

% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.6

Number TICs found: 5CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.33	140	BJ
2.	UNKNOWN HYDROCARBON	5.87	1800	BJ
3.	PROPANOIC ACID ESTER	16.25	320	J
4.	HEXANEDIOIC ACID ESTER	24.57	180	J
5.	UNKNOWN ALKANE	28.85	110	J

9713512.1830
1D

000083

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B098Y7

Lab Name: TMA/ARLI Contract: WHC
 Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA
 Matrix: (soil/water) SOIL Lab Sample ID: A310014-01K
 Sample wt/vol: 30.4 (g/mL) G Lab File ID: _____
 % Moisture: 8 decanted: (Y/N) N Date Received: 10/11/93
 Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/13/93
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/03/93
 Injection Volume: 1.00 (uL) Dilution Factor: 1.00
 GPC Cleanup: (Y/N) Y pH: 9.6 Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	Q
319-84-6	alpha-BHC	1.8 U
319-85-7	beta-BHC	1.8 U
319-86-8	delta-BHC	1.8 U
58-89-9	gamma-BHC (Lindane)	1.8 U
76-44-8	Heptachlor	1.8 U
309-00-2	Aldrin	1.8 U
1024-57-3	Heptachlor epoxide	1.8 U
959-98-8	Endosulfan I	1.8 U
60-57-1	Dieldrin	3.5 U
72-55-9	4,4'-DDE	3.5 U
72-20-8	Endrin	3.5 U
33213-65-9	Endosulfan II	3.5 U
72-54-8	4,4'-DDD	3.5 U
1031-07-8	Endosulfan sulfate	3.5 U
50-29-3	4,4'-DDT	3.5 U
72-43-5	Methoxychlor	18 U
53494-70-5	Endrin ketone	3.5 U
7421-36-3	Endrin aldehyde	3.5 U
5103-71-9	alpha-Chlordane	1.8 U
5103-74-2	gamma-Chlordane	1.8 U
8001-35-2	Toxaphene	180 U
12674-11-2	Aroclor-1016	35 U
11104-28-2	Aroclor-1221	72 U
11141-16-5	Aroclor-1232	35 U
53469-21-9	Aroclor-1242	35 U
12672-29-6	Aroclor-1248	35 U
11097-69-1	Aroclor-1254	35 U
11096-82-5	Aroclor-1260	35 U

9713512.1831

TMA Inc.

REPORT

Work Order # A3-10-014

Received: 10/11/93

Results by Sample

SAMPLE ID B098Y7 FRACTION Q1H TEST CODE 8015MS NAME EPA 8015M EXTRACT.
Date & Time Collected 10/07/93 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

9713512.1832

Page 1

Skinner&Sherman

REPORT

Work Order # S3-10-098

Received: 10/12/93

12/02/93 13:29:36

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

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Dan Steurmer

ATTEN Client Services

CERTIFIED BY

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

PHONE (617) 890-7200

CONTACT DP

WORK ID N3-10-030
TAKEN By Client
TRANS Fed Ex
TYPE Soil
P.O. # N3-10-030
INVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this workorder

- 01 B098Y7
- 02 B098Y8
- 02 B098Y8 DUPL
- 02 B098Y8 SPIKE
- 03 LCSS

NITR S Nitrate/Nitrite in Soils



This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated payment 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
1-800-4LAB TEST FAX (617) 890-3883

Received: 10/12/93

Results by Sample

SAMPLE ID <u>B098Y7</u>	SAMPLE # <u>01</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/07/93</u> Category <u>SOIL</u>
NITR_S <u><2.45</u>	
mg N/kg	
SAMPLE ID <u>B098Y8</u>	SAMPLE # <u>02</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/07/93</u> Category <u>SOIL</u>
NITR_S <u><2.48</u>	
mg N/kg	
SAMPLE ID <u>B098Y8</u> DUPL	SAMPLE # <u>02</u> FRACTIONS: <u>B</u>
	Date & Time Collected <u>10/07/93</u> Category <u>SOIL</u>
NITR_S <u><2.48</u>	
mg N/kg	
SAMPLE ID <u>B098Y8</u> SPIKE	SAMPLE # <u>02</u> FRACTIONS: <u>C</u>
	Date & Time Collected <u>10/07/93</u> Category <u>SOIL</u>
NITR_S <u>22.1</u>	
mg N/kg	
SAMPLE ID <u>LCSS</u>	SAMPLE # <u>03</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>not specified</u> Category <u>SOIL</u>
NITR_S <u>1.97</u>	
mg N/L	

TMA

Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

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

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

9713512.1834

Page 4

Skinner&Sherman

REPORT

Work Order # S3-10-098

Received: 10/12/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

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

TMA

Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until 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 subpoenas or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

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

9713512.1865

TMA/Skinner & Sherman Laboratories Sample Login Sheet

Workorder 5310098 Client Hanford NW Number/Type of Samples 2 soil
 Protocol CLP Turnaround 33 Day Cooler Temp: 3 °C, or N/A Cooler Yes/No
 Custodian: B. Powell Shipper & # FedEx SDG/Batch# N/A
 Custody Seal: Present/Absent/Intact/Not Client Case# N310030
 Purchase Order/Contract# N310030 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: 10/2/93 _____
 List any date with paperwork/shipment problems & specify the problem: _____

Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1 <u>B09847</u>	<u>Soil</u>	<u>10/2/93</u>	<u>N/A</u>	<u>N03N02</u>	
2 <u>B09848</u>	<u>↓</u>	<u>↓</u>	<u>h</u>	<u>2.5 ↓</u>	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

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

Subcontract: Yes No To: _____ Date: _____

Reviewed _____ Date _____

* EPA/CLP required

*comp was BP
10/12/93*

TMA

9713512.1836

Thermo Analytical Inc.**Skinner & Sherman Labs., Inc.**

300 Second Avenue

Post Office Box 521

Waltham, MA 02254-0521

(617) 890-7200

FAX (617) 890-3883

RECORD COPY

November 23, 1993

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

Quality Control NarrativeScope

One (1) soil sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on October 12, 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 S310097.

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 recovery for antimony and manganese exceeded the control limit requirements.

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

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven R. Provencal
Steven R. Provencal
Lead Chemist

1-12-94

9713512.1837

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

8098Y7

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

Lab Code: SKINER Case No.: N3-10-030SAS No.: SOG No.: 8098Y7

Matrix (soil/water): SOIL Lab Sample ID: S310097-01 S

Level (low/med): LOW Date Received: 10/12/93

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7350			P
7440-36-0	Antimony	2.8	B	N	P
7440-38-2	Arsenic	8.6			P
7440-39-3	Barium	104			P
7440-41-7	Beryllium	0.40	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	20400			P
7440-47-3	Chromium	8.4			P
7440-48-4	Cobalt	11.8			P
7440-50-8	Copper	15.8			P
7439-89-6	Iron	22400			P
7439-92-1	Lead	7.5			P
7439-95-4	Magnesium	6990			P
7439-96-5	Manganese	415		N	P
7439-97-6	Mercury	0.06	B		CV
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	1200			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	0.96	B		P
7440-23-5	Sodium	223	B		P
7440-28-0	Thallium	0.32	U		P
7440-62-2	Vanadium	55.2			P
7440-66-6	Zinc	46.6		E	P
	Cyanide	0.53	U		CA
7440-32-6	Titanium	1780			P

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9713512 1818

Sampled 10/7/93

TMA/Skinner & Sherman Laboratories

Sample Login Sheet

Workorder S310097 Client Hanford Nor Number/Type of Samples Soil
 Protocol CP Turnaround 33 DAY Cooler Temp: 3 °C, or N/A Cooler Yes/No
 Custodian: B Pro... Shipper & # Fed Ex SDG/Batch# N/A
 Custody Seal: Present/Absent/Intact/Not Client Case# V310030
 Purchase Order/Contract# N310030 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: 10/12/93 _____
 List any date with paperwork/shipment problems & specify the problem: _____

N/A

Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1 <u>B09847</u>	<u>Soil</u>	<u>10/12/93</u>	<u>NA</u>	<u>D.S Tm + Cu + Titanium</u>	
2 <u>B 10121990</u>	<u>10/12/93</u>	<u>10/12/93</u>			
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

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

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

Reviewed _____ Date _____ Comp. WAC SP
10/12/93

TMA**Thermo Analytical Inc.**

9713512.1839

TMA/Norcal

2030 Wright Avenue

P. O. Box 4040

Richmond, CA 94804-0040

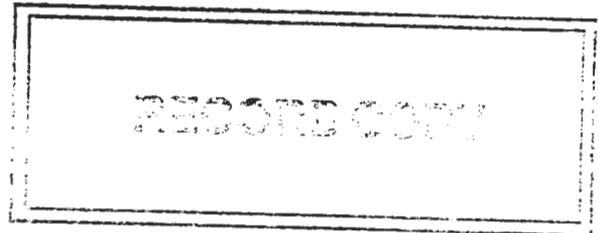
(510) 235-2633 Fax No (510) 235-0438



January 7, 1994

Ref: TMA/Norcal N3-10-032-7273

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



Dear Ms. Colley:

Enclosed is the data report for the two soil samples received October 11, 1993 from location 200 UP-02. 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 403.

Please call if you have any questions concerning this data.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dinkar P. Kharkar".

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

DPK/ss.

Enclosure: Data Package

TMA/Norcal

Report N3-10-032-7273

Sample Delivery Group 7273

Westinghouse Hanford Corporation

P.O. MB-SW-092

Case Narrative

January 7, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7293 is comprised of the two soil samples from location 200-UP-2 delivered under Field Log Book #EFL-1091. Chain-of-Custody number were not provided.

One 1000 mL plastic bottle of each sample was received for the analyses. A sufficient amount of sample was not available to meet the gamma nuclide MDA's for the duplicate sample.

2.0 ANALYSIS NOTES**2.1 Gross Alpha Analyses**

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Strontium-90 Analyses

The 2σ error for sample BO98Y7 is larger than both the MDA and the result implying that the MDA may not be a good estimate of the "real" minimum detectable activity.

2.5 Technetium-99 Analyses

The negative result of sample BO98Y7 is less than the negative of its 2σ counting error. The MDA of technetium-99 for the duplicate of sample BO98Y7 is higher than the result due to a relatively low chemical yield.

2.6 Iodine-129 Analyses

No problems were encountered by the laboratory in the analyses.

2.7 Total Uranium Analyses

No problems were encountered by the laboratory in the analyses.

TMA/Norcal

Report N3-10-032-7273
Sample Delivery Group 7273

Westinghouse Hanford Corporation
P.O. MB-SW-092

Case NarrativeJanuary 7, 1994

ANALYSIS NOTES (cont'd)**2.8 Neptunium-237 Analyses**

Low chemical yields were initially obtained for neptunium analyses. The samples were reanalyzed, and though the sample yields were within contractual limits, yields for the blank and laboratory control sample (LCS) were low, 15% and 7%, respectively. There was not enough sample to perform a reanalysis using the nominal 1.0 g aliquot and there was no sample remaining for another reanalysis. No cause could be determined for the poor yields. The neptunium-237 recovery in the laboratory control sample is 71% which is below the 3σ total limits of (81-119)% due to the low chemical yield.

2.9 Isotopic Uranium Analyses

Uranium-238 activity in the blank is greater than the MDA but well below RDL.

2.10 Isotopic Plutonium Analyses

Plutonium-239/240 activity above the RDL was found in the the blank but does not compromise the sample result because the concentration in the sample is less than the MDA. The plutonium-238 MDA for sample BO98Y7 is higher than the RDL due to a 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 are higher than the RDL's due to the small amount of sample available for analysis.

9713512.1842

TMA NORCAL
REPORTING GROUP 7273

N310032-01

B098Y7

DATA SHEET

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-01
Dept sample id 7273-001
Received 10/09/93
% moisture 7.9

Client sample id B098Y7
Location/Matrix 200-UP-2 SOLID
Collected 10/07/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	11	4.4	4	10		80A
Gross Beta	Beta	18	4.2	5	10		80B
Selenium 79	15758-45-9	0.008	0.008	0.01	10	U	SE
Strontium 90	10098-97-2	-0.13	1.1	0.8	1	U	Y
Technetium 99	14133-76-7	-0.39	0.23	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.32	0.58	1	2	U	I
Uranium 233/234		0.51	0.18	0.1	0.3		U
Uranium 235	15117-96-1	0.060	0.060	0.1	0.3	U	U
Uranium 238		0.59	0.18	0.09	0.3	B	U
Total Uranium (ug/g)	7440-61-1	1.7	0.31	0.03	0.1	X	U_T
Neptunium 237	13994-20-2	0.008	0.016	0.02	0.2	U	NP
Plutonium 238	13981-16-3	0.003	0.034	0.06	0.05	U	PU
Plutonium 239/240		0.020	0.014	0.03	0.05	U	PU
Americium 241	14596-10-2	0.002	0.010	0.02	0.05	U	TP
Curium 244	13981-15-2	-0.007	0.007	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.06		U	GAM
Potassium 40	13966-00-2	13	1.1				GAM
Manganese 54	13966-31-9	U		0.05		U	GAM
Iron 59	14596-12-4	U		0.2	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		0.05		U	GAM
Ruthenium 103	13968-53-1	U		0.07		U	GAM
Ruthenium 106	13967-48-1	U		0.4		U	GAM
Tin 113	13966-06-8	U		0.07		U	GAM
Cesium 134	13967-70-9	U		0.06		U	GAM
Cesium 137	10045-97-3	U		0.05	0.05	U	GAM

DATA SHEETS

Page 1

SUMMARY DATA SECTION

Page 17

0 21

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 01/07/94

9713512.1843

TMA NORCAL
REPORTING GROUP 7273

N310032-01

B098Y7

DATA SHEET, cont

SDG 7273
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310032-01
Dept sample id 7273-001
Received 10/09/93
% moisture 7.9Client sample id B098Y7
Location/Matrix 200-UP-2 SOLID
Collected 10/07/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Cerium 144	14762-78-8	U		0.3		U	GAM
Europium 152	14683-23-9	U		0.1	0.1	U	GAM
Europium 154	15585-10-1	U		0.08	0.1	U	GAM
Europium 155	14391-16-3	U		0.2	0.1	U	GAM
Radium 226	13982-63-3	0.56	0.11				GAM
Radium 228	15262-20-1	0.89	0.20				GAM
Thorium 228	14274-82-9	0.92	0.072				GAM
Thorium 232	7440-29-1	0.89	0.20				GAM

9713512.1844

TMA NORCAL
REPORTING GROUP 7273

N310032-02

DATA SHEET

B098Y8

SDG 7273
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310032-02
Dept sample id 7273-002
Received 10/09/93
% moisture 2.9Client sample id B098Y8
Location/Matrix 200-UP-2 SOLID
Collected 10/07/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	5.7	3.7	4	10	J	80A
Gross Beta	Beta	15	4.3	6	10		80B
Technetium 99	14133-76-7	-0.22	0.062	0.1	0.5	U	TC
Uranium 233/234		0.46	0.19	0.1	0.3		U
Uranium 235	15117-96-1	0.018	0.036	0.1	0.3	U	U
Uranium 238		0.60	0.19	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.0	0.19	0.03	0.1	X	U_T

9713512.1845

001001



CORPORATE SUPPORT GROUP
18200 VON KARMAN AVE.
IRVINE, CA 92715

997 332 663

3 C.O.I

DATE 10-08-93 ORIGIN PSC DEST. SORT CODE

SHIPPER'S REFERENCE NO. 1 81710 PT2AB W94-0009#8 SHIPPER'S ACCOUNT NO. 741484192

CONSIGNEE'S REFERENCE NO. 2 CONSIGNEE'S ACCOUNT NO. AIRBILL NUMBER 997 332 663

COMPANY JG HOGAN DEPT./FLOOR U S DEPT OF ENERGY C/O WESTINGHOUSE

COMPANY TMA/NORCAL DEPT./FLOOR TO (CONSIGNEE NAME) TMA/NORCAL DELORES SANCHEZ PHONE NO.

FROM (YOUR NAME) HANFORD CO WESTINGHOUSE SHIPPING DEPT (509) 376-6655

ACCURATE STREET ADDRESS (BURCLINGTON CANNOT DELIVER TO A P.O. BOX) 2030 WRIGHT AVENUE

STREET ADDRESS 2030 STEVENS DR

CITY RICHLAND STATE RA ZIP (REQUIRED) 94352

CITY RICHMOND STATE CA ZIP (REQUIRED) 94804

CONSIGNEE'S C MARK IF APPLICABLE BURLINGTON AIR EXPRESS WILL CHECK MAKE PAYABLE ONLY TO VALUE OF THE GOODS IN THE BOX

DECLARED \$

LIMIT OF LIABILITY IS AGREED AT TO BE \$50.00 OR \$: WHICHEVER IS GREAT HIGHER VALUE IS DECLARED CHARGES PAID SIDE OF AIRBILL. PAR. DECLARED VALUE LIMIT.

1-800-CALL FOR INFORMATION BAX OFFICE NE

4 BILLING INFORMATION

PREPAID (SHIPPER) \$ CASH RECEIVED (PAID IN ADVANCE)

COLLECT (CONSIGNEE)

3RD PARTY (ACCT. NO. OR BILLING ADDRESS REQ'D.)

ACCOUNT NO.

COMPANY/NAME

STREET ADDRESS

CITY STATE ZIP

5 SERVICE REQUESTED

OVERNIGHT (NEXT BUSINESS DAY)

SECOND DAY

NEXT FLIGHT OUT

CHECK BELOW IF PACKAGE IS:

LETTER

G.O.H. (GARMENT ON HANGER)

6 HANDLING INFORMATION (*SPECIAL RATE MAY APPLY)

HOLD AT BAX DANGEROUS GOODS SATURDAY DELIVERY SPECIAL DELIVERY CONVENTION GOVERNMENT SHIPPING

SPECIAL INSTRUCTIONS / ADDITIONAL REFERENCE INFORMATION:

NO. OF PCS. WEIGHT LENGTH WIDTH HEIGHT DESCRIPTION

1 65 SML 54B SOIL SAMPLES

TOTAL PCS. TOTAL WT. 1 65 SKID(S) SAID TO CONTAIN NO.

RATE QUOTE NUMBER RECEIVED BY BAX AT SHIPPER'S DOOR BAX TERMINAL

TIME/DATE OF PICK-UP DRIVER NO.

SIGNATURE OF SHIPPER *[Signature]* 10-8-93

RELEASE SIGNATURE *[Signature]* SIGNED FOR BAX *[Signature]*

OUTSIDE CARRIER CHARGES ADVANCE

\$ PRO NUMBER

CARRIER NAME

997 332 663

AIRBILL NUMBER

OP 100 (11-92)

NON-NEGOTIABLE AIRBILL SUBJECT TO TERMS AND CONDITIONS OF CONTRACT ON REVERSE SIDE.

CONSIGNEE C

0 61

AIR OVERNIGHT / SATURDAY DELIVERY

Contractor WESTINGHOUSE HANFORD	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W94-0-0009-7
---	--------------------------------------	--

PART I - TO BE COMPLETED BY ORIGINATOR

Department Processing and Analytical Lab	Section	Unit Sampling & Mobile Lab
--	---------	--

The following items are to be shipped from Contractor Vendor

Routing **BURLINGTON AIR EXPRESS** Contractor Vendor

Shipped to TMA/NORCAL 2030 Wright Av Richmond CA 94804	Off-site Custodian Delores Sanchez
	Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1	POLYCOOLER. SAMPLES PACKED IN PLASTIC BAGS AND STORED ON WET ICE SAMPLE #B09913 WEIGHT 32# COOLER # 1982	

Classified Unclassified Shipped Under DOE Contract Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property
Samples require analysis that are not presently available at this site.

SAF #93-323
COC #005072-13

BILL OFFLADING # 997 332 781

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release S.N. 612	RM Survey No. 117007	Date 10/8/93
Location of Property (Area & Bldg.) 200 WEST / 202-S	Contact C. D. Hayes	Phone 373-2891
Date Ready for Shipment 10/08/93	Cost Code to be Charged NTLD2/Org Code: 12911	Approximate Date This Property will be Returned N/A
Relinquished by: S. M. Steele	Date & Time	Authorized By Jeannette E. Hyatt
Signature and Name of Property Control	Custodian Date	Property Management Approval J.P. Hankel
		Date 10/8/93

PART II - TO BE COMPLETED BY SHIPPING

Signature of Recipient C. Miller	Return Order No. 062	Date Issued	Purchase Order No.	Date Issued
Date 10-8-93				

DISTRIBUTION

By Originator White, Green, Yellow, Pink - Property Management Goldenrod - Retain	Shipping Operation - Sign all Copies and Forward to: White - Property Management Green - Property Control Custodian (Issuing Office) Yellow - Retain Pink - Originator
--	---

MEMORANDUM



TO: 200 UP-2 Project QA Record

March 14, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: PESTICIDE/PCB DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628PES.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
Notes:			
1. Indicates the samples were analyzed for target compound list (TCL) pesticides and arochlor PCB's.			

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

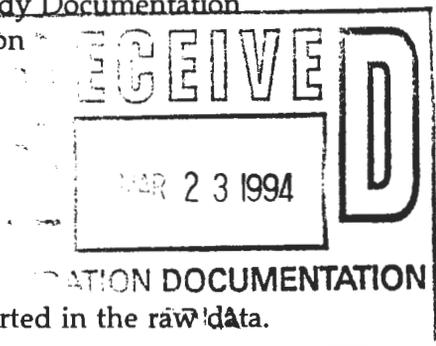
Precision. Goals for precision were met.

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.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of twenty-eight (28) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.



MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

WHC, 1993a, Validation of 200 UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC, 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF 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.

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ATTACHMENT 2
AS QUALIFIED DATA SUMMARY

9713512.1853

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp#		B098Y7	
	Units	Result	Q	
	Samp#	10-7-93		
	Date			
	Location	---		
	Depth	---		
	Type	---		
	Comments	---		
Parameter	Units	Result	Q	
ALPHA-BHC	UG/KG	1.800	U	
BETA-BHC	UG/KG	1.800	U	
DELTA-BHC	UG/KG	1.800	U	
GAMMA-BHC (LINDANE)	UG/KG	1.800	U	
HEPTACHLOR	UG/KG	1.800	U	
ALDRIN	UG/KG	1.800	U	
HEPTACHLOR EPOXIDE	UG/KG	1.800	U	
ENDOSULFAN I	UG/KG	1.800	U	
DIELDRIN	UG/KG	3.500	U	
4,4'-DDE	UG/KG	3.500	U	
ENDRIN	UG/KG	3.500	U	
ENDOSULFAN II	UG/KG	3.500	U	
4,4'-DDD	UG/KG	3.500	U	
ENDOSULFAN SULFATE	UG/KG	3.500	U	
4,4'-DDT	UG/KG	3.500	U	
METHOXYCHLOR	UG/KG	18.000	U	
ENDRIN KETONE	UG/KG	3.500	U	
ENDRIN ALDEHYDE	UG/KG	3.500	U	
ALPHA-CHLORDANE	UG/KG	1.800	U	
GAMMA-CHLORDANE	UG/KG	1.800	U	
TOXAPHENE	UG/KG	180.000	U	
AROCLOR-1016	UG/KG	35.000	U	
AROCLOR-1221	UG/KG	72.000	U	
AROCLOR-1232	UG/KG	35.000	U	
AROCLOR-1242	UG/KG	35.000	U	
AROCLOR-1248	UG/KG	35.000	U	
AROCLOR-1254	UG/KG	35.000	U	
AROCLOR-1260	UG/KG	35.000	U	

Verified *R* 3-14-94

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

~~3-11-94~~ ~~000083~~

EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI Contract: WHC
 Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA
 Matrix: (soil/water) SOIL Lab Sample ID: A310014-01K
 Sample wt/vol: 30.4 (g/mL) G Lab File ID: _____
 % Moisture: 8 decanted: (Y/N) N Date Received: 10/11/93
 Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/13/93
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/03/93
 Injection Volume: 1.00 (uL) Dilution Factor: 1.00
 GPC Cleanup: (Y/N) Y pH: 9.6 Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8	U
309-00-2	Aldrin	1.8	U
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	3.5	U
72-55-9	4,4'-DDE	3.5	U
72-20-8	Endrin	3.5	U
33213-65-9	Endosulfan II	3.5	U
72-54-8	4,4'-DDD	3.5	U
1031-07-8	Endosulfan sulfate	3.5	U
50-29-3	4,4'-DDT	3.5	U
72-43-5	Methoxychlor	18	U
53494-70-5	Endrin ketone	3.5	U
7421-36-3	Endrin aldehyde	3.5	U
5103-71-9	alpha-Chlordane	1.8	U
5103-74-2	gamma-Chlordane	1.8	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	72	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

Verified ~~3-11-94~~

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9713512.1857

000002A
R 3-18-94

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 10-7-93

Ice Chest No. SML-54B Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____ Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) ^{SER 10-7-93} **BO88Y7**
- 1,250ml P:CLP;TAL Metals,Hg,Ti
 - 1,250ml aGs:VOA CLP
 - 1,250ml aG:Semi-VOA CLP
 - 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 - 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 - 1,125ml G:Cyanide CLP
 - 1,125ml Gw:Kerosene (8015M)
 - 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 aGs PCB/Pest~~
- ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~
 - ~~1,250ml Gs:VOA CLP~~
 - ~~1,250ml aG:Semi-VOA CLP~~
 - ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
 - ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
 - ~~1,125ml G:Cyanide CLP~~
 - ~~1,125ml Gw:Kerosene (8015M)~~
 - ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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) ^{SER 10-7-93}
- ~~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), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>10-8-93</u> <u>W. E. Rogers</u>	Received by: <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 11:22</u>
Relinquished by: <u>JG HOGAN</u>	Received by: <u>H. HANCOCK</u>	Date/Time: <u>10-11-93 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

Rec'd SATURDAY 10-9-93 OPENED 10/11/93 011

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241
Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

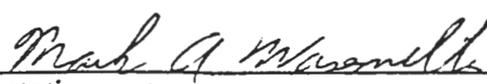
DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball 
HASM Project Coordinator (Print/Sign Name)

11-4-93
Date

Mark Wasemiller 
Technical Representative (Print/Sign Name)

11/12/93
Date

N/A
Quality Assurance (Print/Sign Name)

Date

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

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

2.0 SAMPLE LIST :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

~~RC 3-18-94~~
~~000075~~

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.

Nicole Roth

Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish

Maureen Parrish 12/14/93
Program Manager

9713512.1863

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B09847-TMA-628		
VALIDATOR:	LAB: TMA		DATE: 3-9-94		
CASE:	10-014		SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP3/90	<input type="checkbox"/> SW-846 8080	<input type="checkbox"/> SW-846 8081	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	B09847 / SOIL				

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? *note ①* . . . **Yes** No N/A

Is a case narrative present? Yes No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

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

Comments: See Form B-1.

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable Yes No **N/A**

Are calibration standard retention times acceptable? Yes No **N/A**

Are DDT and endrin breakdowns acceptable? Yes No **N/A**

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? Yes No (N/A)
Is the GC/MS tuning/performance check acceptable? Yes No (N/A)

Comments:

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? Yes No (N/A)
Are quantitation column calibration factor %RSD values acceptable? Yes No (N/A)
Were the analytical sequence requirements met? Yes No (N/A)
Are continuing calibration %D values acceptable? Yes No (N/A)

Comments:

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? (Yes) No N/A
Was the resolution acceptable in the resolution check mix? (Yes) No N/A
Is resolution acceptable in the PEM, INDA and INDB? (Yes) No N/A
Are DDT and Endrin breakdowns acceptable? (Yes) No N/A
Are retention times in PEMs and calibration mixes acceptable? (Yes) No N/A
Are RPD values in the PEMs acceptable? (Yes) No N/A
Are %RSD values acceptable? (Yes) No N/A

Comments:

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? (Yes) No N/A
Is resolution acceptable in the PEMs? (Yes) No N/A
Are initial calibrations acceptable? (Yes) No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

- Are retention times acceptable in the PEMs, INDA and INDB mixes? Yes No N/A
- Are RPD values in the PEMs acceptable? Yes No N/A
- Are the DDT and endrin breakdowns acceptable? Yes No N/A
- Was GPC cleanup performed? Yes No N/A
- Is the GPC calibration check acceptable? Yes No N/A
- Was Florisil cleanup performed? Yes No N/A
- Is the Florisil performance check acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? *See note ①* Yes No N/A
- Were field/trip blanks analyzed? *See note ②* Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ① Methoxychlor in method blank, No qualification since sample results are non-detect. See MB Summary sheet
② QC field samples not identified with this sample set but have been requested. Field QC data will be evaluated in the final data Summary.

5. ACCURACY

- Were surrogates analyzed? Yes No N/A
- Are surrogate recoveries acceptable? Yes No N/A
- Were MS/MSD samples analyzed? Yes No N/A
- Are MS/MSD results acceptable? Yes No N/A
- Were LCS samples analyzed? *See note ①* Yes No N/A
- Are LCS results acceptable? Yes No N/A

Comments: ① LCS analysis not required when MS/MSD results are present.

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? Yes No N/A

Are laboratory duplicate results acceptable? See Note ① . . Yes No N/A

Are field duplicate RPD values acceptable? See note ② . . Yes No N/A

Are field split RPD values acceptable? Yes No N/A

Comments: ① Laboratory duplicate analysis not required since MS/MSD analysis is present.

② Field QC samples not identified with this sample set, but have been requested. Field QC will be evaluated in the final data Summary.

7. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? Yes No N/A

Are positive results resolved acceptably? . Note ① Yes No N/A

Comments: ① All sample results are non-detect.

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? Yes No N/A

Is compound quantitation acceptable? Yes No N/A

Comments: _____

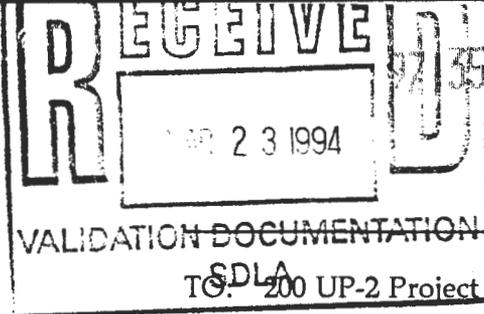
9. REPORTED RESULTS AND QUANTITATION LIMITS

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

Comments: _____



97 3512.1869

MEMORANDUM



March 18, 1994

TO: SDLA 200 UP-2 Project QA Record

FR: Thomas Stapp, Golder Associates Inc.

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628MET.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1

Notes:

1. Indicates the samples were analyzed for CLP TAL metals, titanium, and cyanide.

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 ICP serial dilution results as indicated under "Minor Deficiencies" below.

Accuracy. Goals for accuracy were met, with the exception of the matrix spike recoveries as indicated under "Minor Deficiencies" below.

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

Detection Limits. Detection limit goals were met for all sample results.

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 the work plan completeness objective 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 Times

- The mercury analysis holding time exceeded the 28 day limit, therefore the mercury result for sample B098Y7 has been qualified as estimated (J).

Blanks

- Silver was detected in the continuing calibration blank, therefore the associated sample result less than five times the blank value has been qualified as undetected (U) as shown in Attachment 2.

Matrix Spike Recoveries

- Matrix spike recoveries for antimony, and manganese were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied, and supporting documentation.

ICP Serial Dilution

- The zinc serial dilution percent difference exceeded the 10% limit for sample results greater than 50 times the IDL, therefore the result for sample B098Y7 has been qualified as estimated (J).

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.

9713512.1871

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.

9713512.1873

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9713512.1875

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp# B098Y7		Result	Q
	Date	Location		
	10-7-93	---		
	Depth	---		
	Type	---		
	Comments	---		
Parameter	Units		Result	Q
ALUMINUM	MG/KG		7350.000	
ANTIMONY	MG/KG		2.800	BJ
ARSENIC	MG/KG		8.600	
BARIUM	MG/KG		104.000	
BERYLLIUM	MG/KG		0.400	B
CADMIUM	MG/KG		0.260	U
CALCIUM	MG/KG		20400.000	
CHROMIUM	MG/KG		8.400	
COBALT	MG/KG		11.800	
COPPER	MG/KG		15.800	
IRON	MG/KG		22400.000	
LEAD	MG/KG		7.500	
MAGNESIUM	MG/KG		6990.000	
MANGANESE	MG/KG		415.000	J
MERCURY	MG/KG		0.060	BJ
NICKEL	MG/KG		8.400	
POTASSIUM	MG/KG		1200.000	
SELENIUM	MG/KG		0.560	U
SILVER	MG/KG		0.960	U
SODIUM	MG/KG		223.000	B
THALLIUM	MG/KG		0.320	U
VANADIUM	MG/KG		55.200	
ZINC	MG/KG		46.600	J
CYANIDE	MG/KG		0.530	U
TITANIUM	MG/KG		1780.000	

Verified *FS* 3-18-94

800

9713512.1876

9713512.1877

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

8098Y7

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

Lab Code: SKINER Case No.: N3-10-030SAS No.: SOG No.: 8098Y7

Matrix (soil/water): SOIL Lab Sample ID: S310097-01 S

Level (low/med): LOW Date Received: 10/12/93

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7350			P
7440-36-0	Antimony	2.8	8	N	P BJ
7440-38-2	Arsenic	8.6			P
7440-39-3	Barium	104			P
7440-41-7	Beryllium	0.40	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	20400			P
7440-47-3	Chromium	8.4			P
7440-48-4	Cobalt	11.8			P
7440-50-8	Copper	15.8			P
7439-89-6	Iron	22400			P
7439-92-1	Lead	7.5			P
7439-95-4	Magnesium	6990			P
7439-96-5	Manganese	415	1	N	P
7439-97-6	Mercury	0.06	8		CV BJ
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	1200			P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	0.96	8		P U
7440-23-5	Sodium	223	B		P
7440-28-0	Thallium	0.32	U		P
7440-62-2	Vanadium	55.2			P
7440-66-6	Zinc	46.6	1	E	P J
	Cyanide	0.53	U		CA
7440-32-6	Titanium	1780	1		P

Q

BJ

J BJ

U

J

CA

P

3-18-94
Verified
3-8-94

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

009

3-18-94

9713512.1878

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

TMA

9713512.1878

Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.

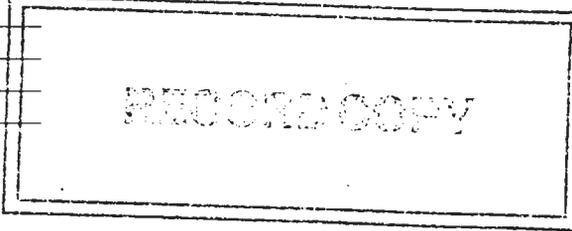
300 Second Avenue

Post Office Box 521

Waltham, MA 02254-0521

(617) 890-7200

FAX (617) 890-3883



November 23, 1993

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 October 12, 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 S310097.

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 recovery for antimony and manganese exceeded the control limit requirements.

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

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal
Steven R. Provencal
Lead Chemist

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241

Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

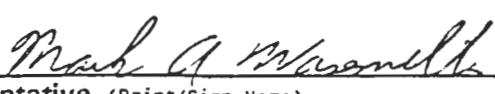
On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball  11-4-93
HASM Project Coordinator (Print/Sign Name) Date

Mark Wasemiller  11/12/93
Technical Representative (Print/Sign Name) Date

N/A _____
Quality Assurance (Print/Sign Name) Date

9713512-1880

000002A

3/18/94

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 10-7-93

Ice Chest No. 5ML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ ~~1,250ml Gs:VOA CLP~~ ~~1,250ml aG:Semi-VOA CLP~~ ~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~ ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ ~~1,125ml G:Cyanide CLP~~ ~~1,125ml Gw:Kerosene (8015M)~~ ~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~
 GER 10-7-93 BOBYT
- 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~~
 1,250ml aG PCB/Pest
- 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~~
 GER 10-7-93

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

Relinquished by: <i>10-8-93</i> <i>Sharon E. Rogers 1122</i>	Received by: <i>JG HOGAN</i> <i>JG HOGAN</i>	Date/Time: <i>10-8-93 / 11:22</i>
Relinquished by: <i>JG HOGAN</i> <i>JG HOGAN 10-8-93 1135</i>	Received by: <i>H. Narziso</i> <i>JG HOGAN TMA/NORCAL</i>	Date/Time: <i>10-11-93 8:00</i>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

Rec'd SATURDAY 10-9-93

OPENED 10/11/93

9713512.1881

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B098Y7-TMA-628		
VALIDATOR:	T. Stapp	LAB: TMA	DATE: 3-7-94		
CASE:	N3-10-030		SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<input type="checkbox"/> CLP/GFAA	<input checked="" type="checkbox"/> CLP/Hg	<input checked="" type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	B098Y7 / 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: Performed by WHC

2. HOLDING TIMES

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

Comments: Hg analysis exceeds holding time @ 31 days. Associated sample results qualified J/UJ.

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? . . . See note ② . . . 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? . See note ① Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ① Field GC, including Field/Trip Blanks are not identified with this sample set, but have been requested. Field GC will be evaluated in the final data summary.
 ② See blank summary page B-3. /

5. ACCURACY

- Were spike samples analyzed? Yes No N/A
- Are spike sample recoveries acceptable? . . See Summary sheet Yes No N/A
- Were laboratory control samples (LCS) analyzed? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: _____

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? *See Precision Summary* Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? *See note ①* . . . Yes No N/A

Comments: ① Field QC including duplicates and/or splits were not identified with this sample set, but have been requested. Field QC will be evaluated in the final data 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

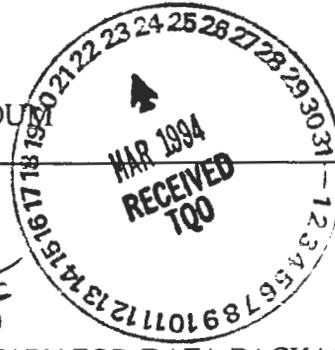
Comments: Furnace analyses not performed.

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: _____

MEMORANDUM



TO: 200 UP-2 Project QA Record

March 18, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE
B098Y7-TMA-628 (923-E418 628EXTR.UP2)**INTRODUCTION**

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
Notes:			
1. Indicates the sample was analyzed for extractable fuel hydrocarbons (kerosene range) by SW-846 method 8015M.			

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

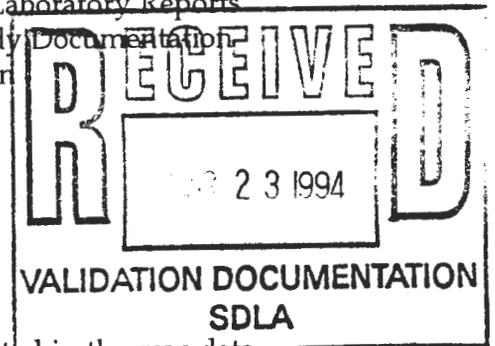
Precision. Goals for precision were met.

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.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of one (1) determination reported, which was deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective 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 deficiency was identified during data validation which required qualification of data.

Holding Time

- The holding time of 40 days for extractable fuel hydrocarbons was exceeded, therefore the result for sample B098Y7 has been qualified as estimated (UJ).

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.

9713512.1891

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.

9713512.1893

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9713512.1895

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Y7-TMA-628

	Samp#	B098Y7	
	Date	10-7-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
KEROSENE	MG/KG	5.000	UJ

verified *RE* 3-15-94

9713512 1897
TWA Inc.

REPORT

Work Order # A3-10-014

000741
3-18-4

Received: 10/11/93

Results by Sample

SAMPLE ID B098Y7

FRACTION 01H TEST CODE 8015MS NAME EPA 8015M EXTRACT.

Date & Time Collected 10/07/93

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

G
UT

ND = Not detected at the specified limits

Form 1

Verified AS 3-18-94

9713512.1898

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9713512.1899

000002A
RC-3-18-94

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 10-7-93
 Ice Chest No. SML-54B Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) ag SER 10-7-93 BO98Y7
 1,250ml P:CLP;TAL Metals,Hg,Ti
 1,250ml aGs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 ags PCB/Rest
 1,250ml P:CLP;TAL Metals,Hg,Ti
 1,250ml Gs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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) SER 10-7-93
 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), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>10-8-93</u> <u>Horace E. Rogers 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 11:22</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. NARCISO</u> <u>H. NARCISO TMA/NORCAL</u>	Date/Time: <u>10-11-93 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: _____ Disposed by: _____ Date/Time: _____

Comments:

Rec'd SATURDAY 10-9-93 OPENED 10/11/93

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

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

2.0 SAMPLE LIST :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

~~3-18-94~~
~~000075~~

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.

Nicole Roth

Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish

Maureen Parrish 12/14/93
Program Manager

9713512.1904

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT:	200 UP-2		DATA PACKAGE: B09847-TMA-628		
VALIDATOR:	T. Stapp	LAB: TMA	DATE: 3-14-94		
CASE:			SDG:		
* ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input checked="" type="checkbox"/> 8015 Modified	<input type="checkbox"/> 8020	<input type="checkbox"/> 8021	8140	8141
<input type="checkbox"/> 8150	<input type="checkbox"/> 8151	<input type="checkbox"/> WTPH-HCID	<input type="checkbox"/> WTPH-G	<input type="checkbox"/> WTPH-D	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX: B09847 - SOIL					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Note ① . Yes No N/A

Is a case narrative present? Yes No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: See HOLDING TIME Summary page B-1.

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? Yes No N/A

Are %RSD values for calibration or response factors acceptable? Yes No N/A

Comments: _____

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? Yes No N/A

Are %D values for calibration or response factors acceptable? Yes No N/A

Comments: _____

4. BLANKS

Were laboratory blanks analyzed? Yes No N/A

Are laboratory blank results acceptable? Yes No N/A

Were field/trip blanks analyzed? Note ① Yes No N/A

Are field/trip blank results acceptable? Yes No N/A

Comments: ① Field GC samples were not identified in this sample set, but have been requested. Field GC will be evaluated in the final data Summary.

5. ACCURACY

Were surrogates analyzed? Yes No N/A

Are surrogate recoveries acceptable? NOTE ① Yes No N/A

Were MS/MSD samples analyzed? Yes No N/A

Are MS/MSD recoveries acceptable? NOTE ② Yes No N/A

Were LCS samples analyzed? Yes No N/A

Are LCS recoveries acceptable? NOTE ③ Yes No N/A

3-15

GENERAL GC DATA VALIDATION CHECKLIST

Comments: ① Surrogate Compounds were not added to samples, blanks, or calib. Stnds. No qualification applied, see note ②.

② MS/MSD recoveries are 61% and 59% respectively and will be acceptable for data package accuracy requirements.

③ LCS recovery @ 70% which is similar to MS/MSD recoveries and 6. PRECISION qualification will not be applied. Control limits not provided by Lab

Are MS/MSD sample RPD values acceptable? . . . NOTE ② . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . NOTE ① . . . Yes No N/A

Are field split RPD values acceptable? Yes No N/A

Comments: ① Field QC including Field duplicate and/or splits are not identified in this sample set, but it has been requested. Field QC will be evaluated in the final data Summary.

② Lab precision control limits not provided, however good agreement obtained @ 3% RSD - RPD and no qualification will be applied

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? Yes No N/A

Is compound quantitation acceptable? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? Yes No N/A

Are all results supported in the raw data? Yes No N/A

Do results meet the CRQLs? NOTE ① Yes No N/A

Comments: CRQL values have not been provided for SW-846 analyses.

MEMORANDUM

TO: 200 UP-2 Project QA Record

FR: Thomas Stapp, Golder Associates Inc. RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
B098Y7-TMA-628 (923-E418 628GEN.UP2)

March 18, 1994

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
B098Y8	10/07/93	SOIL	SEE NOTE 2
Notes:			
1. Indicates the sample was analyzed for Nitrate/Nitrite as N (by colorimetry), and fluoride, chloride, and sulfate anions (by ion chromatography).			
2. Indicates the sample was analyzed for Nitrate/Nitrite as N (by colorimetry).			

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

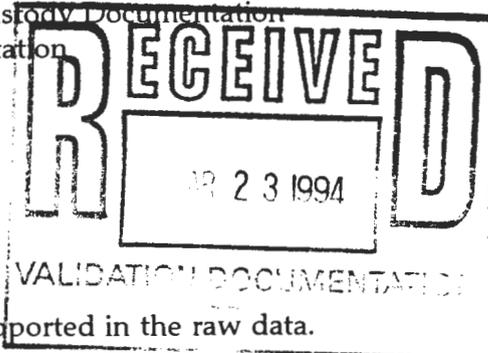
Precision. Goals for precision were met.

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.

Completeness. The data package was complete for all requested analyses. A total of two (2) samples were validated in this data package with a total of five (5) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.



MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

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.

9713512.1911

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.

9713512.1913

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9713512.1915

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp#	B098Y7		B098Y8	
	Date	10-7-93		10-7-93	
	Location	---		---	
	Depth	---		---	
	Type	---		---	
	Comments	---		---	
	Units	Result	Q	Result	Q
CHLORIDE	MG/KG	6.000		---	
FLUORIDE	MG/KG	3.200		---	
SULFATE	MG/KG	8.000		---	
NITRATE+NITRITE-N	MG-N/K	2.450	U	2.480	U

Verified *RS* 3-14-94

8001

9713512.1916

9713512.1917

3-7-94

Page 2

Skinner&Sherman

REPORT

Work Order # S3-10-098

Received: 10/12/93

Results by Sample

SAMPLE ID B098Y7 SAMPLE # 01 FRACTIONS: A
 Date & Time Collected 10/07/93 Category SOIL
 NITR_S <2.45
 mg N/kg

Q

u

SAMPLE ID B098Y8 SAMPLE # 02 FRACTIONS: A
 Date & Time Collected 10/07/93 Category SOIL
 NITR_S <2.48
 mg N/kg

u

SAMPLE ID B098Y8 DUPL SAMPLE # 02 FRACTIONS: B
 Date & Time Collected 10/07/93 Category SOIL
 NITR_S <2.48
 mg N/kg

SAMPLE ID B098Y8 SPIKE SAMPLE # 02 FRACTIONS: C
 Date & Time Collected 10/07/93 Category SOIL
 NITR_S 22.1
 mg N/kg

SAMPLE ID LCSS SAMPLE # 03 FRACTIONS: A
 Date & Time Collected not specified Category SOIL
 NITR_S 1.97
 mg N/L

Verified 3-7-94

009



Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

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

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

9713512.1918

TMA Inc.

REPORT

~~3-18-94~~ 000009

Work Order # A3-10-014

Received: 10/11/93

Results by Sample

SAMPLE ID B098Y7 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids
Date & Time Collected 10/07/93 Category _____

ANIONS AND WET CHEMISTRY - SOLIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	6.0	mg/kg	1.0
Fluoride	300.0	3.2	mg/kg	0.5
Sulfate	300.0	8	mg/kg	5

FORM I

Verified

~~3-7-94~~

9713512.1919

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

GENERAL CHEMISTRY RESULTS

CASE NO. 10-014

Soil Sample #:

B098Y7

B098Y9

CASE NARRATIVE

Sample B098Y7 did not exhibit homogeneity. Therefore, the percent RPD for Fluoride was 24.6%.

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

Maureen Parrish 12/9/93

Maureen Parrish

9715512.1921

3-18-94 000002A

Westinghouse Hanford Company CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
Company Contact L E ROGERS
Project Designation/Sampling Locations 200-UP-2
Ice Chest No. SML-54B
Bill of Lading/Airbill No.
Method of Shipment OVERNIGHT AIR SERVICE
Shipped to TMA
Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) 1,250ml P:CLP;TAL Metals,Hg,Ti BOB8Y7
1,250ml aGs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 aGs PCB/Pest
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 SER 10-7-93
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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)

Table with 3 columns: Relinquished by, Received by, Date/Time. Includes handwritten signatures and dates like 10-8-93, 10-11-93.

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:
Comments:

Rec'd SATURDAY 10-9-92

OPENED 10/11/93

HANFORD ANALYTICAL SERVICES MANAGEMENT RECORD OF DISPOSITION	ROD-93-0241 <small>Record of Disposition No.</small>
---	---

DATE: November 4, 1993	LABORATORY: TMA
------------------------	-----------------

PROJECT TITLE/NO.: 200-UP-2 / 93-263	NCR NO.: N/A
--------------------------------------	--------------

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

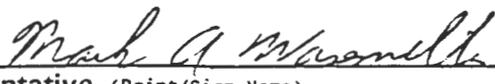
DESCRIPTION OF EVENT:

On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball  HASM Project Coordinator (Print/Sign Name)	11-4-93 Date
Mark Wasemiller  Technical Representative (Print/Sign Name)	11/12/93 Date
N/A Quality Assurance (Print/Sign Name)	Date

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3-18-91

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 10-7-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) B09848
 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) PER 10-8-93
 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)

Field Transfer of Custody

Chain of Possession

(Sign and Print Names)

Relinquished by: <u>Robert E. Rogers 10-8-93 1120</u>	Received by: <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1120</u>
Relinquished by: <u>JG HOGAN 10-8-93 / 1135</u>	Received by: <u>H. NARCISO</u>	Date/Time: <u>10-11-93 / 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

Rec'd SATURDAY . OPENED 10-11-93
10-9-93

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B098Y7-TMA-628		
VALIDATOR:	T. Stapp	LAB: TMA/Skinner & Sh.	DATE: 3-4-94		
CASE:	N3-10-030		SDG:		
ANALYSES PERFORMED					
<input type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input checked="" type="checkbox"/> Chloride (2)	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₂ /NO ₃ (1) (2)
<input checked="" type="checkbox"/> Sulfate (2)	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fluoride (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX (1) B098Y8, B098Y7 / SOIL					
(2) B098Y7 / 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: Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: See HOLDING TIME SUMMARY page A-26 in checklist form B-1 (attached).

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3-7-94

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? NOTE ① Yes No N/A
 Are field/trip blank results acceptable? Yes No N/A

Comments: ① Field QC including field/trip blanks were not identified in this sample set, but it has been requested. Field QC will be evaluated in the final data summary.

5. ACCURACY

Were spike samples analyzed at the required frequency? Yes No N/A
 Are spike recoveries acceptable? NOTE ① Yes No N/A
 Were LCS analyses performed at the required frequency? NOTE ② Yes No N/A
 Are LCS recoveries acceptable? Yes No N/A

Comments: ① QC sheet indicates MS recovery of 95% for NO₂/NO₃ but calculated result is 111% - No qualifier applied.
② NO₂/NO₃ LCS raw data not provided, but it has been requested. Reported results acceptable & within limits.

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? SEE NOTE ① Yes No N/A
 Are field split RPD values acceptable? Yes No N/A

MEMORANDUM

TO: 200 UP-2 Project QA Record

April 21, 1994

FR: Thomas Stapp, Golder Associates Inc. 

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628VOA.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
B098Y9	10/08/93	SOIL	
Notes:			
1. Indicates the samples were analyzed for target compound list (TCL) volatile 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.

Completeness. The data package was complete for all requested analyses. A total of two (2) samples were validated in this data package with a total of sixty-six (66) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

Revised 4-21-94
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MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- An unknown hydrocarbon detected in sample B098Y9 has been qualified 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.

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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.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Units	B098Y7 10-7-93		B098Y9 10-8-93	
		Result	Q	Result	Q
CHLOROMETHANE	UG/KG	11.000	U	10.000	U
BROMOMETHANE	UG/KG	11.000	U	10.000	U
VINYL CHLORIDE	UG/KG	11.000	U	10.000	U
CHLOROETHANE	UG/KG	11.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	11.000	U	10.000	U
ACETONE	UG/KG	11.000	U	10.000	U
CARBON DISULFIDE	UG/KG	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	11.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	11.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	11.000	U	10.000	U
CHLOROFORM	UG/KG	11.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	11.000	U	10.000	U
2-BUTANONE	UG/KG	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	11.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	10.000	U
TRICHLOROETHENE	UG/KG	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	11.000	U	10.000	U
BENZENE	UG/KG	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	10.000	U
BROMOFORM	UG/KG	11.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	11.000	U	10.000	U
2-HEXANONE	UG/KG	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	11.000	U	10.000	U
TOLUENE	UG/KG	11.000	U	10.000	U
CHLOROBENZENE	UG/KG	11.000	U	10.000	U
ETHYLBENZENE	UG/KG	11.000	U	10.000	U
STYRENE	UG/KG	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	11.000	U	10.000	U

Verified 4-21-94

Revised 4-21-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI

Contract: WHC

Lab Code: TMALA

Case No.: 10014

SAS No.: NA

SDG No.: NA

Matrix: (soil/water) SOIL

Lab Sample ID: A310014-01A

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: 31020R08

Level: (low/med) LOW

Date Received: 10/11/93

% Moisture: not dec. 8

Date Analyzed: 10/20/93

GC Column: PACK ID: 2.00 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

Q

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B098Y9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31020R03

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

% Moisture: not dec. 0 Date Analyzed: 10/20/93

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

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	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	U
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

Q

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Revised 4-21-94

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B098Y9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 31020R03

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

% Moisture: not dec. 0 Date Analyzed: 10/20/93

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

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	28.08	10	<input checked="" type="checkbox"/>

Q
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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

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

2.0 SAMPLE LIST :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

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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.

Nicole Roth

Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish

Maureen Parrish 12/14/93
Program Manager

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Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-7-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) 1,250ml aG PCB 10-7-93 BO98Y7
 P:CLP;TAL Metals,Hg,Ti
 Gs:VOA CLP
 aG:Semi-VOA CLP
 G:Anions F,Cl,S04 (EPA 300.0)
 P/G:Anions NO2,NO3 (EPA 353.2)
 G:Cyanide CLP
 Gw:Kerosene (8015M)
 P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 aG PCB/Rest
 P:CLP;TAL Metals,Hg,Ti
 Gs:VOA CLP
 aG:Semi-VOA CLP
 G:Anions F,Cl,S04 (EPA 300.0)
 P/G:Anions NO2,NO3 (EPA 353.2)
 G:Cyanide CLP
 Gw:Kerosene (8015M)
 P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 10-7-93
 Gs:VOA CLP
 aG:Semi-VOA CLP
 G:Anions F,Cl,S04 (EPA 300.0)
 P/G:Anions NO2,NO3 (EPA 353.2)
 G:Cyanide CLP
 Gw:Kerosene (8015M)
 P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>10-8-93</u> <u>Thorne E. Rogers 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93</u> / <u>11:22</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. NARCISO</u> <u>H. NARCISO TMA/NORCAL</u>	Date/Time: <u>10-11-93</u> 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
------------------	--------------	------------

Comments:

Rec'd SATURDAY
10-9-92

OPENED 10/11/93

Westinghouse
Hanford Company

9713512.1946

CHAIN OF CUSTODY

000002c
10-3-18-94

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-8-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

1) BO98Y9

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

PER 10-8-93

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: <u>10-8-93</u> <u>J. E. Rogers</u> 1120	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1120</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN</u> 10-8-93/1135	Received by: <u>H. NARCISO</u> <u>H. NARCISO</u> TMA/HORCAL	Date/Time: <u>10-11-93 / 8:00</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

Rec'd 10-9-93 TMA/HORCAL OPENED 10/11/93

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241
Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

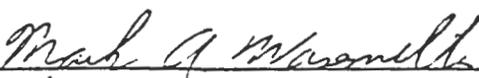
DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball 
HASM Project Coordinator (Print/Sign Name)

11-4-93
Date

Mark Wasemiller 
Technical Representative (Print/Sign Name)

11/12/93
Date

N/A
Quality Assurance (Print/Sign Name)

Date

9713512.1948

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	ZOO UP-2		DATA PACKAGE: BC9847-TMA-628		
VALIDATOR:	T. Stapp	LAB: TMA	DATE: 3-10-94		
CASE:	10-014		SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8250 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	BC9847, BC9849 / SOIL				

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . Note ① . **Yes** No N/A

Is a case narrative present? **Yes** No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

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

Comments: See Holding Time Summary page B-1

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? . Note. ① Yes No N/A

Are continuing calibrations acceptable? Yes No N/A

Comments: ① %RSD for 3 ~~sec~~ compounds exceeds the upper limit of 20.5%, qualifying associated results as estimated (1/4)
See Calibration data Summary page B-2.

① compounds indicated above are erratically performing compounds and have no %RSD criteria for initial calibration, therefore No qualifiers will be applied.

Were laboratory blanks analyzed? Yes No N/A

Are laboratory blank results acceptable? Yes No N/A

Were field/trip blanks analyzed? Note. ① Yes No N/A

Are field/trip blank results acceptable? Yes No N/A

Comments: ① Field GC including equipment and trip blanks were not identified in this sample set, but have been requested. Field GC will be evaluated in the final data Summary.

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: _____

022
Revised *JS*
4-21-94

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? Yes No N/A
 Are field duplicate RPD values acceptable? Note ① Yes No N/A
 Are field split RPD values acceptable? Yes No N/A

Comments: ① Field QC for duplicates and split samples were not identified in this sample set, but the information has been requested. Field QC data will be evaluated in the final data Summary.

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 Note ①

Comments: ① The TIC for sample B09849 has been qualified as presumptive and estimated (N/A) according to WHC data validation requirements. (IN)

3-18-94

9713512.1953

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

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Revised
4-21-94
RK -025

TO: 200 UP-2 Project QA Record

April 21, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: SEMIVOLATILE DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Y7-TMA-628 (923-E418 628SEMI.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Y7	10/07/93	SOIL	SEE NOTE 1
Notes:			
1. Indicates the samples were analyzed for 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.

Completeness. The data package was complete for all requested analyses. A total of one (1) sample was validated in this data package with a total of sixty-four (64) 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.

4-20-94 Revised
TS
-001

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 sample affected, data qualification applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUNDS

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- An unknown alkane detected in the sample has been qualified as presumptive and valid (JN).
- TICs were detected in the sample and associated laboratory blank and have been qualified due to associated blank contamination and determined to be presumptive and valid (UJN). Attachments 3 and 5 provide a summary of the sample affected, data qualification applied and supporting documentation.

REFERENCES

WHC, 1993a, Validation of 200 UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

WHC, 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

9713512.1956

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
7/40/99
WLL* 004

9713512.1958

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9713512.1960

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp#		B098Y7	
	Units	Result	Q	
	Date	10-7-93		
	Location	---		
	Depth	---		
	Type	---		
	Comments	---		
PHENOL	UG/KG	350.000	U	
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U	
2-CHLOROPHENOL	UG/KG	350.000	U	
1,3-DICHLOROBENZENE	UG/KG	350.000	U	
1,4-DICHLOROBENZENE	UG/KG	350.000	U	
1,2-DICHLOROBENZENE	UG/KG	350.000	U	
2-METHYLPHENOL	UG/KG	350.000	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U	
4-METHYLPHENOL	UG/KG	350.000	U	
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U	
HEXACHLOROETHANE	UG/KG	350.000	U	
NITROBENZENE	UG/KG	350.000	U	
ISOPHORONE	UG/KG	350.000	U	
2-NITROPHENOL	UG/KG	350.000	U	
2,4-DIMETHYLPHENOL	UG/KG	350.000	U	
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U	
2,4-DICHLOROPHENOL	UG/KG	350.000	U	
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U	
NAPHTHALENE	UG/KG	350.000	U	
4-CHLOROANILINE	UG/KG	350.000	U	
HEXACHLOROBUTADIENE	UG/KG	350.000	U	
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U	
2-METHYLNAPHTHALENE	UG/KG	350.000	U	
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U	
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U	
2,4,5-TRICHLOROPHENOL	UG/KG	860.000	U	
2-CHLORONAPHTHALENE	UG/KG	350.000	U	
2-NITROANILINE	UG/KG	860.000	U	
DIMETHYLPHTHALATE	UG/KG	350.000	U	
ACENAPHTHYLENE	UG/KG	350.000	U	
3-NITROANILINE	UG/KG	860.000	U	
ACENAPHTHENE	UG/KG	350.000	U	

Verified ~~by~~ 3-15-94

800

9713512.1961

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp#		B098Y7	
	Units	Result	Q	
				Date
				10-7-93
				Location

				Depth

				Type

				Comments

2,4-DINITROPHENOL	UG/KG	860.000	U	
4-NITROPHENOL	UG/KG	860.000	U	
DIBENZOFURAN	UG/KG	350.000	U	
2,4-DINITROTOLUENE	UG/KG	350.000	U	
2,6-DINITROTOLUENE	UG/KG	350.000	U	
DIETHYLPHTHALATE	UG/KG	350.000	U	
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	
FLUORENE	UG/KG	350.000	U	
4-NITROANILINE	UG/KG	860.000	U	
4,6-DINITRO-2-METHYLPHENOL	UG/KG	860.000	U	
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	
HEXACHLOROBENZENE	UG/KG	350.000	U	
PENTACHLOROPHENOL	UG/KG	860.000	U	
PHENANTHRENE	UG/KG	350.000	U	
ANTHRACENE	UG/KG	350.000	U	
CARBAZOLE	UG/KG	350.000	U	
DI-N-BUTYLPHTHALATE	UG/KG	350.000	U	
FLUORANTHENE	UG/KG	350.000	U	
PYRENE	UG/KG	350.000	U	
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	
BENZO(A)ANTHRACENE	UG/KG	350.000	U	
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	
CHRYSENE	UG/KG	350.000	U	
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	
BENZO(A)PYRENE	UG/KG	350.000	U	
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	
DIBENZO(A,H)ANTHRACENE	UG/KG	350.000	U	
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	

600
 3/21/94
 checked
 by
 HNTS
 5/2/94

973512.1962

9713512.1963

3-18-94

000080

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03

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

% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.6

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

CAS NO.	COMPOUND		
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl) Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	860	U

010

FORM I SV-1

3/90

Verified 3-15-94

9713512.1964

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

* 3-18-94
000081
EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03

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

% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q	
100-02-7	4-Nitrophenol	860	U	
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350	U	
7005-72-3	4-Chlorophenyl-phenylether	350	U	
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	860	U	
534-52-1	4,6-Dinitro-2-methylphenol	860	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	860	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
86-74-8	Carbazole	350	U	
84-74-2	Di-n-Butylphthalate	350	U	
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350	U	
85-68-7	Butylbenzylphthalate	350	U	
91-94-1	3,3'-Dichlorobenzidine	350	U	
56-55-3	Benzo(a)Anthracene	350	U	
117-81-7	bis(2-Ethylhexyl) Phthalate	350	U	
218-01-9	Chrysene	350	U	
117-84-0	Di-n-Octyl Phthalate	350	U	
205-99-2	Benzo(b)Fluoranthene	350	U	
207-08-9	Benzo(k)Fluoranthene	350	U	
50-32-8	Benzo(a)Pyrene	350	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U	
53-70-3	Dibenz(a,h)Anthracene	350	U	
191-24-2	Benzo(g,h,i)Perylene	350	U	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

Verified *[Signature]* 3/90
3-15-94

9713512.1965

3-18-94 000082

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B098Y7

Lab Name: TMA/ARLI Contract: WHC
Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA
Matrix: (soil/water) SOIL Lab Sample ID: A310014-01B
Sample wt/vol: 30.4 (g/mL) G Lab File ID: 31021I03
Level: (low/med) LOW Date Received: 10/11/93
% Moisture: 8 decanted: (Y/N) N Date Extracted: 10/13/93
Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 9.6

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN HYDROCARBON	5.33	140	BJ	UJ
2.	UNKNOWN HYDROCARBON	5.87	1800	BJ	UJ
3.	PROPANOIC ACID ESTER	16.25	320	J	UJ
4.	HEXANEDIOIC ACID ESTER	24.57	180	J	UJ
5.	UNKNOWN ALKANE	28.85	110	J	UJ

Verified 3-15-94 JN 3-18

Revised 4-20-94 -012
3/90

9713512.1966

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9713512.1967

000002A
3-18-94

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 10-7-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) GER 10-7-93 BO98Y7
- 1,250ml ~~P:CLP; TAL Metals, Hg, Ti~~
 - 1,250ml ~~aGs:VOA CLP~~
 - 1,250ml ~~aG:Semi-VOA CLP~~
 - 1,125ml ~~G:Anions F, Cl, SO₄ (EPA 300.0)~~
 - 1,125ml ~~P/G:Anions NO₂, NO₃ (EPA 353.2)~~
 - 1,125ml ~~G:Cyanide CLP~~
 - 1,125ml ~~Gw:Kerosene (8015M)~~
 - 1,1000ml ~~P/G:Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 aGs PCB/Pest
- 1,250ml ~~P:CLP; TAL Metals, Hg, Ti~~
 - 1,250ml ~~Gs:VOA CLP~~
 - 1,250ml ~~aG:Semi-VOA CLP~~
 - 1,125ml ~~G:Anions F, Cl, SO₄ (EPA 300.0)~~
 - 1,125ml ~~P/G:Anions NO₂, NO₃ (EPA 353.2)~~
 - 1,125ml ~~G:Cyanide CLP~~
 - 1,125ml ~~Gw:Kerosene (8015M)~~
 - 1,1000ml ~~P/G:Gross alpha/beta (EP-10), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, K-40, Ru-106, Na-22 (RC-30), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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) GER 10-7-93
- 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), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5) Np-237, (RC-101A, RC-622, EP-5) Pu-238, Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>10-8-93</u> <u>Sharon E. Roggen 1122</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93</u> / <u>11PZ</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 1135</u>	Received by: <u>H. HAZCISO</u> <u>H. HAZCISO TMA/NORCAL</u>	Date/Time: <u>10-11-93</u> 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

Rec'd SATURDAY
10-9-93

OPENED 10/11/93

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 10-014

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : October 11, 1993

1.0 DESCRIPTION OF CASE :

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

2.0 SAMPLE LIST :

<u>WESTINGHOUSE ID</u>	<u>LAB ID</u>	<u>ANALYSIS REQUESTED</u>	<u>MATRIX</u>
B098Y7	A3-10-014-01A	V	SOIL
B098Y7	A3-10-014-01B	SV	SOIL
B098Y7 MS	A3-10-014-01C	SV	SOIL
B098Y7 MSD	A3-10-014-01D	SV	SOIL
B098Y7	A3-10-014-01H	K	SOIL
B098Y7 MS	A3-10-014-01I	K	SOIL
B098Y7 MSD	A3-10-014-01J	K	SOIL
B098Y7	A3-10-014-01K	P	SOIL
B098Y7 MS	A3-10-014-01L	P	SOIL
B098Y7 MSD	A3-10-014-01M	P	SOIL
B098Y9	A3-10-014-02A	V	SOIL
B098Y9 MS	A3-10-014-02B	V	SOIL
B098Y9 MSD	A3-10-014-02C	V	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received intact and properly documented.

On October 23, 1993, the Westinghouse Hanford Company cancelled the analysis of samples B098Y7 and B098Y9, despite the fact that the Volatile samples had already been analyzed, and the samples were extracted for Semivolatiles, Pesticides, and Extractable Hydrocarbons. On November 3, 1993, TMA/ARLI, in accordance with ROD-93-0241, reinitiated the analyses and reporting of the aforementioned samples.

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. No TCL analytes were detected in the samples.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 11/02/93 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by a single injection into a dual column system.

During the analysis sequence, the Autosampler malfunctioned, and after the injection of the PIBLKs and the PEMs, the sequence was continued. The %RSD for all of the analytes were within the QC limits on both of the GC columns, with the exception of alpha- and delta-BHC on the DB-608 column, which were slightly above 20% but less than the 30% limit.

Several Aroclor standards were injected throughout the sequence in order to confirm the presence of Aroclors in the samples. Although the retention times for some peaks exceeded their retention time window, the identification of each Aroclor was based primarily on the pattern recognition for each peak in the chromatogram.

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

The chromatograms are presented in the manner consistent with the capabilities of the Nelson 2700 Turbochrome Data System which normalizes the largest peak to scale.

LOW LEVEL SOIL :

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

The TCX surrogate recoveries on the DB-608 column for samples B098Y7MS and B098Y7MSD were slightly below the advisory QC limits. However, the TCX recoveries on the DB-1701 column were higher for all of the samples in comparison to the DB-608 column, due to the interference peaks that coeluted with TCX on the DB-1701 column, therefore yielding higher recoveries. The %D between the two GC columns, for TCX in the spiked and unspiked samples, were greater than the 25% limit. The DCB recoveries on the two GC columns were comparable for all of the samples.

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

3.2.4 TOTAL PETROLEUM HYDROCARBONS "KEROSENE RANGE" COMMENTS :

SEQUENCE NOTES :

The sequence was started on 12/01/93, with the injection of a continuing calibration, and was analyzed according to the SW-846 Method 8015M. The instrument calibration was performed on 11/18/93 with the injection of 5 different levels of the Kerosene standard. The %RSD for the initial calibration, and the %D for the continuing calibration were all within their respective QC limits as specified by the SW-846 Method 8015M. respectively.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted within the SW-846 holding time. However, the sample extracts were analyzed 10 days outside of the holding time due to laboratory miscommunication. The laboratory has taken the appropriate steps to ensure that this will not happen again. No Kerosene was detected in the samples.

Sample B098Y7 was spiked with Kerosene. The matrix spike recovery in B098Y7MS was 61%, and 59% in sample B098Y7MSD. A blank spike, KLCS1014S, was prepared and analyzed at the same time, and had a 70% recovery.

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

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~~FF~~ 3-18-94

~~000075~~

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.

Nicole Roth

Nicole Roth 12/14/93
CLP Program Manager

Maureen Parrish

Maureen Parrish 12/14/93
Program Manager

9713512.1972

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: B09847-TMA-628		
VALIDATOR:	T. Stapp	LAB:	TMA	DATE:	3-14-94
CASE:	10-014		SDG:		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input checked="" type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	B09847, Soil				

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . Note ① . Yes No N/A

Is a case narrative present? Yes No N/A

Comments: ① Performed by WHC.

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: See Holding Time Summary page B-1.

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? Note ① and ③ Yes No N/A

Were field/trip blanks analyzed? Note ② Yes No N/A

Are field/trip blank results acceptable? Yes No N/A

Comments: ① Lab blank TIC's are present. See Method blank Summary page for results affecting sample TIC's.

② Field blank QC samples have not been identified in this sample set, but have been requested. Field QC will be evaluated in the final data summary.

5. ACCURACY ③ Di-n-butylphthalate raised to CRQL and qualified U, since blank is less than ERQL 5; *sample result*

Were surrogates/System Monitoring Compounds analyzed? Yes No N/A *blank result*

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A *3/2/11*

Were MS/MSD samples analyzed? Yes No N/A

Are MS/MSD results acceptable? Yes No N/A

Comments: _____

sample result

blank result

3/2/11

AW

3/2/11

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? Yes No N/A

Are field duplicate RPD values acceptable? . Note ① Yes No N/A

Are field split RPD values acceptable? Yes No N/A

Comments: ① Field QC duplicates and splits are not identified in this sample set, but it has been requested. Field QC will be evaluated in the final data Summary.

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 Note ①

Comments: ① The ~~unknown alkane~~ TICs have been qualified as presumptive and estimated according to WHC validation procedure.

RS
4-20-94

Revised
4-20-94
022
RE

METHOD BLANK SUMMARY

3-18-94 000267

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1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK1013S1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 10014 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A310014-BLK

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 31021I02

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

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/13/93

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/21/93

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	5.28	130	J
2.	UNKNOWN HYDROCARBON	5.83	1500	J
3.	HEXANEDIOIC ACID ESTER	24.53	99	J
4.	PROPANOIC ACID ESTER	16.22	260	J

All TIC's found ^{will} qualify associated sample B09847 TIC's as ~~non detected (u) when less than 5x the method blank amount.~~ as undetected, presumptive and valid. (USN).

~~3-14-94~~

4-20-94

Revised 4-20-94 -024

MEMORANDUM



TO: 200-UP-2 Project QA Record

March 24, 1994

FR: Kent Angelos, Golder Associates Inc. *MAA*

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR
DATA PACKAGE: B098Y7-TMA-628 (923-E418, B098Y7R.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Y7-TMA-628 prepared by the TMA/Norcal laboratory. A list of samples validated along with the analyses reported and methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B098Y7	10/7/93	SOIL	see Notes
B098Y8	10/7/93	SOIL	

Notes:

1. Sample B098Y7 was analyzed for gross alpha, gross beta, selenium 79, strontium 90, technetium 99, iodine 129, isotopic uranium, isotopic plutonium, total uranium, neptunium 237, americium 241, curium 244 and selected isotopes by gamma spectroscopy.
2. Sample B098Y8 was analyzed for gross alpha, gross beta, technetium-99, isotopic uranium and total uranium.
3. All samples were 100% validated.

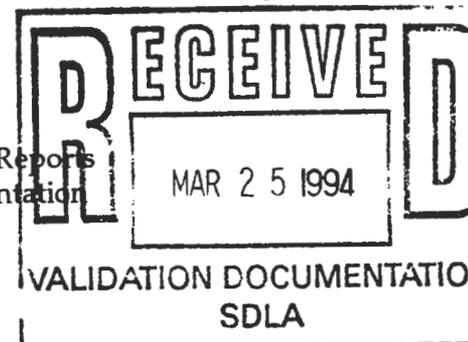
Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

- 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 duplicate results for thorium-288 as discussed under minor deficiencies below.

Accuracy. Goals for accuracy were met.



Sample Result Verification. All sample results were supported in the raw data. However, sample results for total uranium and minimum detectable activities for neptunium-237 and iodine-129 could not be verified accurately by recalculation. No qualification was applied since the sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the laboratory statement of work, with the following exceptions:

SAMPLE ID	ANALYTE	MINIMUM DETECTABLE ACTIVITY REPORTED (pCi/g)	REQUIRED DETECTION LIMIT (pCi/g)
B098Y7	Plutonium-238	0.06	0.05
	Iron-59	0.2	0.05
	Cobalt-58	0.06	0.05
	Europium-155	0.2	0.1

Completeness. The data package was complete for all requested analyses. Two samples were validated in this data package with a total of 42 determinations reported, of which all were deemed valid. This results in a completeness of 100 percent, which meets normal work plan data quality objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified which required qualification of results as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified which required qualification of data.

Laboratory Blanks

- Uranium-238 was detected in the reagent blank, therefore all associated sample results have been qualified as estimated (J). Supporting documentation is provided in Attachments 2 and 5.

Laboratory Duplicates

- Duplicate sample relative percent difference (RPD) was greater than 35% for thorium-228 therefore, the associated sample results have been qualified as estimated (J). Supporting documentation is provided in Attachments 2 and 5.

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. December 1993. Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF 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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B7

628 ~~unt~~ 3/24/94

SDG: B098Y7-TMA-611	Validator: K. Angelos	Date: March 24, 1994	Page <u>1</u> OF <u>1</u>
Comments: Radiochemistry			
Compound/Analyte	Qualifier	Samples Affected	Reason
Uranium-238	J	B098Y7, B098Y8	Detected in reagent blank
Thorium-228	J	B098Y7	Duplicate RPD >35%

9713512.1982

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND
ANNOTATED LABORATORY REPORTS

9713512.1983

TMA NORCAL
REPORTING GROUP 7273

N310032-01

B098Y7

DATA SHEET

SDG <u>7273</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310032-01</u>	Client sample id <u>B098Y7</u>
Dept sample id <u>7273-001</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/09/93</u>	Collected <u>10/07/93</u>
% moisture <u>7.9</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	<u>11</u>	4.4	4	10		80A
Gross Beta	Beta	<u>18</u>	4.2	5	10		80B
Selenium 79	15758-45-9	0.008	0.008	<u>0.01</u>	10	U	SE
Strontium 90	10098-97-2	-0.13	<u>1.1</u>	<u>0.8</u>	1	U	Y
Technetium 99	14133-76-7	<u>-0.39</u>	0.23	<u>0.2</u>	0.5	U	TC
Iodine 129	15046-84-1	0.32	0.58	<u>1</u>	2	U	I
Uranium 233/234		<u>0.51</u>	0.18	0.1	0.3		U
Uranium 235	15117-96-1	0.060	0.060	<u>0.1</u>	0.3	U	U
Uranium 238		<u>0.59</u>	0.18	0.09	0.3	B J	U
Total Uranium (ug/g)	7440-61-1	<u>1.7</u>	0.31	0.03	0.1	X	U_T
Neptunium 237	13994-20-2	0.008	0.016	<u>0.02</u>	0.2	U	NP
Plutonium 238	13981-16-3	0.003	0.034	<u>0.06</u>	0.05	U	PU
Plutonium 239/240		0.020	0.014	<u>0.03</u>	0.05	U	PU
Americium 241	14596-10-2	0.002	0.010	<u>0.02</u>	0.05	U	TP
Curium 244	13981-15-2	-0.007	0.007	<u>0.02</u>	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		<u>0.06</u>		U	GAM
Potassium 40	13966-00-2	<u>13</u>	1.1				GAM
Manganese 54	13966-31-9	U		<u>0.05</u>		U	GAM
Iron 59	14596-12-4	U		<u>0.2</u>	0.05	U	GAM
Cobalt 58	13981-38-9	U		<u>0.06</u>	0.05	U	GAM
Cobalt 60	10198-40-0	U		<u>0.04</u>	0.05	U	GAM
Niobium 94	14681-63-1	U		<u>0.05</u>		U	GAM
Ruthenium 103	13968-53-1	U		<u>0.07</u>		U	GAM
Ruthenium 106	13967-48-1	U		<u>0.4</u>		U	GAM
Tin 113	13966-06-8	U		<u>0.07</u>		U	GAM
Cesium 134	13967-70-9	U		<u>0.06</u>		U	GAM
Cesium 137	10045-97-3	U		<u>0.05</u>	0.05	U	GAM

*Verified
3/21/94
[Signature]*

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.28</u>
Report date	<u>01/07/94</u>

Validated Data Summary, Data Package: B098Y7-TMA-628

Parameter	Samp#	B098Y7		B098Y8	
	Date	10/7/93		10/7/93	
	Units	Result	Q	Result	Q
GROSS ALPHA	pCi/g	11.000		5.700	
GROSS BETA	pCi/g	18.000		15.000	
SELENIUM-79	pCi/g	0.010	U	---	
STRONTIUM-90	pCi/g	0.800	U	---	
TECHNETIUM-99	pCi/g	0.200	U	0.100	U
IODINE-129	pCi/g	1.000	U	---	
URANIUM-233/234	pCi/g	0.510		0.460	
URANIUM-235	pCi/g	0.100	U	0.100	U
URANIUM-238	pCi/g	0.590	J	0.600	J
TOTAL URANIUM	ug/g	1.700		1.000	
NEPTUNIUM-237	pCi/g	0.020	U	---	
PLUTONIUM-238	pCi/g	0.060	U	---	
PLUTONIUM-239/240	pCi/g	0.030	U	---	
AMERICIUM-241	pCi/g	0.020	U	---	
CURIUM-244	pCi/g	0.020	U	---	
SODIUM-22	pCi/g	0.060	U	---	
POTASSIUM-40	pCi/g	13.000		---	
MANGANESE-54	pCi/g	0.050	U	---	
IRON-59	pCi/g	0.200	U	---	
COBALT-58	pCi/g	0.060	U	---	
COBALT-60	pCi/g	0.040	U	---	
NIObIUM-95	pCi/g	0.050	U	---	
RUTHENIUM-103	pCi/g	0.070	U	---	
RUTHENIUM-106	pCi/g	0.400	U	---	
TIN-113	pCi/g	0.070	U	---	
CESIUM-134	pCi/g	0.060	U	---	
CESIUM-137	pCi/g	0.050	U	---	
CERIUM-144	pCi/g	0.300	U	---	
EUROPIUM-152	pCi/g	0.100	U	---	
EUROPIUM-154	pCi/g	0.080	U	---	
EUROPIUM-155	pCi/g	0.200	U	---	
RADIUM-226	pCi/g	0.560		---	
RADIUM-228	pCi/g	0.890		---	
THORIUM-228	pCi/g	0.920	J	---	
THORIUM-232	pCi/g	0.890		---	

Verified
3/22/94
MA

971512.1994

9713512.1985

TMA NORCAL
REPORTING GROUP 7273

N310032-01

B098Y7

DATA SHEET, cont

SDG <u>7273</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310032-01</u>	Client sample id <u>B098Y7</u>
Dept sample id <u>7273-001</u>	Location/Matrix <u>200-UP-2 SOLID</u>
Received <u>10/09/93</u>	Collected <u>10/07/93</u>
% moisture <u>7.9</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Cerium 144	14762-78-8	U		<u>0.3</u>		U	GAM
Europium 152	14683-23-9	U		<u>0.1</u>	0.1	U	GAM
Europium 154	15585-10-1	U		<u>0.08</u>	0.1	U	GAM
Europium 155	14391-16-3	U		<u>0.2</u>	0.1	U	GAM
Radium 226	13982-63-3	0.56	0.11				GAM
Radium 228	15262-20-1	0.89	0.20				GAM
Thorium 228	14274-82-9	0.92	0.072			J	GAM
Thorium 232	7440-29-1	0.89	0.20				GAM

*Verified
CMA
3/21/94*

~~0 25~~

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.28</u>
Report date	<u>01/07/94</u>

9713512.1986

ATTACHMENT 4

LABORATORY NARRATIVE AND
CHAIN-OF-CUSTODY DOCUMENTATION

9713512.1987

TMA NORCAL
REPORTING GROUP 7273

DATA SHEET

N310032-02

B098Y8

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-02
Dept sample id 7273-002
Received 10/09/93
% moisture 2.9

Client sample id B098Y8
Location/Matrix 200-UP-2 SOLID
Collected 10/07/93
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	<u>5.7</u>	3.7	4	10	J	80A
Gross Beta	Beta	<u>15</u>	4.3	6	10		80B
Technetium 99	14133-76-7	<u>-0.22</u>	0.062	<u>0.1</u>	0.5	U	TC
Uranium 233/234		<u>0.46</u>	0.19	0.1	0.3		U
Uranium 235	15117-96-1	0.018	0.036	<u>0.1</u>	0.3	U	U
Uranium 238		<u>0.60</u>	0.19	0.1	0.3	J	U
Total Uranium (ug/g)	7440-61-1	<u>1.0</u>	0.19	0.03	0.1	X	U_T

*Verified
DWT
3/21/94*

~~020~~

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 01/07/94

TMA/Norcal

Report N3-10-032-7273

Sample Delivery Group 7273

Westinghouse Hanford Corporation

P.O. MB-SW-092

Case Narrative

January 7, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7293 is comprised of the two soil samples from location 200-UP-2 delivered under Field Log Book #EFL-1091. Chain-of-Custody number were not provided.

One 1000 mL plastic bottle of each sample was received for the analyses. A sufficient amount of sample was not available to meet the gamma nuclide MDA's for the duplicate sample.

2.0 ANALYSIS NOTES**2.1 Gross Alpha Analyses**

No problems were encountered by the laboratory in the analyses.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Selenium-79 Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Strontium-90 Analyses

The 2σ error for sample BO98Y7 is larger than both the MDA and the result implying that the MDA may not be a good estimate of the "real" minimum detectable activity.

2.5 Technetium-99 Analyses

The negative result of sample BO98Y7 is less than the negative of its 2σ counting error. The MDA of technetium-99 for the duplicate of sample BO98Y7 is higher than the result due to a relatively low chemical yield.

2.6 Iodine-129 Analyses

No problems were encountered by the laboratory in the analyses.

2.7 Total Uranium Analyses

No problems were encountered by the laboratory in the analyses.

Case Narrative

Page 1 of 2



TMA/Norcal

Report N3-10-032-7273

Sample Delivery Group 7273

Westinghouse Hanford Corporation

P.O. MB-SW-092

Case Narrative

January 7, 1994

ANALYSIS NOTES (cont'd)**2.8 Neptunium-237 Analyses**

Low chemical yields were initially obtained for neptunium analyses. The samples were reanalyzed, and though the sample yields were within contractual limits, yields for the blank and laboratory control sample (LCS) were low, 15% and 7%, respectively. There was not enough sample to perform a reanalysis using the nominal 1.0 g aliquot and there was no sample remaining for another reanalysis. No cause could be determined for the poor yields. The neptunium-237 recovery in the laboratory control sample is 71% which is below the 3σ total limits of (81-119)% due to the low chemical yield.

2.9 Isotopic Uranium Analyses

Uranium-238 activity in the blank is greater than the MDA but well below RDL.

2.10 Isotopic Plutonium Analyses

Plutonium-239/240 activity above the RDL was found in the the blank but does not compromise the sample result because the concentration in the sample is less than the MDA. The plutonium-238 MDA for sample BO98Y7 is higher than the RDL due to a 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 are higher than the RDL's due to the small amount of sample available for analysis.

9713512.1990

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 10-7-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

- 1) 1,250ml ag ser 10-7-93 BO98Y7
 P:CLP;TAL Metals,Hg,Ti
 1,250ml aG:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 ags PCB/Pest
 1,250ml P:CLP;TAL Metals,Hg,Ti
 1,250ml Gs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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 ser 10-7-93
 1,250ml Gs:VOA CLP
 1,250ml aG:Semi-VOA CLP
 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,125ml G:Cyanide CLP
 1,125ml Gw:Kerosene (8015M)
 1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-303, RC-309, RC-304) 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: <u>10-8-93</u> <u>Norm E. Fogart</u> 1122	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93</u> / <u>1122</u>
Relinquished by: <u>JG HOGAN</u> 10-8-93 1135	Received by: <u>H. Narcius</u> <u>JG HOGAN</u>	Date/Time: <u>10-11-93</u> 8:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: _____ Disposed by: _____ Date/Time: _____

Comments:

OPENED 10-11-93

Rec'd SATURDAY
10-9-93

055

9713512.1991

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 10-7-93
 Ice Chest No. SML-54B Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) B0984B
 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) PER 10-8-93
 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)

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

Relinquished by: <u>10-8-93</u> <u>Loren E. Rogers 1120</u>	Received by: <u>JG HOGAN</u> <u>JG HOGAN</u>	Date/Time: <u>10-8-93 / 1120</u>
Relinquished by: <u>JG HOGAN</u> <u>JG HOGAN 10-8-93 / 1135</u>	Received by: <u>H. NARCISO</u> <u>H. NARCISO TMA/NORCAL</u>	Date/Time: <u>10-11-93 / 8500</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: _____ Disposed by: _____ Date/Time: _____
 Comments: _____

Rec'd SATURDAY 10-9-93 OPENED 10-11-93 w/

9713512.1992

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 10-8-93

Ice Chest No. SML-54B

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

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

Sample Identification

1) ~~1,250ml P:CLP;TAL Metals,Hg,Ti~~ **809849**
~~1,250ml Gs:VOA CLP~~
~~1,250ml aG:Semi-VOA CLP~~
~~1,125ml G:Anions F,Cl,SO4 (EPA 300.0)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,125ml G:Cyanide CLP~~
~~1,125ml Gw:Kerosene (8015M)~~
~~1,1000ml P/G:Gross alpha/beta (EP-10), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152,
 Eu-154,Eu-155,K-40,Ru-106,Na-22 (RC-30), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5) Np-
 237,(RC-101A, RC-622, EP-5) Pu-238,Pu-239/240 (EP-80, EP-81, EP-5) I-129 (RC-25, RC-605) Sr-90 (RC-306, RC-
 303, RC-309, RC-304) Tc-99 (RC-24, RC-604) Am-241,Cm-244 (EP-80, EP-90, EP-91, EP-92, EP-93, EP-5) Se-79~~

*Analysis cancelled when requested
and as per HASM see attached
list 3/2/94*

~~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~~

SR 10-8-93

~~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: <u>10-8-93</u> <u>Jaron E. Rogers</u>	Received by: <u>JG HOGAN</u> <u>J Hogan</u>	Date/Time: <u>10-8-93 / 1120</u>
Relinquished by: <u>JG HOGAN</u> <u>J Hogan</u>	Received by: <u>H. NARCISO</u> <u>Janus TMA/HORCAL</u>	Date/Time: <u>10-11-93 / 8:00</u>
Relinquished by: _____	Received by: _____	Date/Time: _____
Relinquished by: _____	Received by: _____	Date/Time: _____

Final Sample Disposition

Disposal Method: _____	Disposed by: _____	Date/Time: _____
Comments: _____		

~~059~~

Rec'd 10-9-93 TMA/HORCAL . OPENED 10-11-93

9713512.1993

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0241
Record of Disposition No.

DATE: November 4, 1993

LABORATORY: TMA

PROJECT TITLE/NO.: 200-UP-2 / 93-263

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS: B098Y7, B098Y9

DESCRIPTION OF EVENT:

On October 25th, HASM received direction regarding samples B098Y7 and B098Y9 taken 4-6' from the surface. The entire suite of analyses listed on SAF 93-263 were requested for sample B098Y7 and VOA's were requested for the trip blank (sample B098Y9). HASM was informed that samples taken from the 4-6' depth should only have radiochemistry analyses requested since they are apart of a sitewide background study. TMA was subsequently informed to cancel all non-radchem analyses for sample B098Y7 and cancel the VOA analysis for B098Y9. On November 3rd, HASM was informed that all of the requested analyses on the Chain of Custody should be performed for samples B098Y7 and B098Y9. Due to the delay, two analyses (CN and Hg) exceeded holding time limits.

DISPOSITION OF SAMPLES:

With the customer's consent, TMA was instructed to proceed with all the analyses listed on the Chain of Custody, including CN and Hg which exceeded holding times. The customer understands that data obtained for CN and Hg may be for information only.

APPROVAL SIGNATURES:

Jon W. Ball

HASM Project Coordinator (Print/Sign Name)

11-4-93

Date

Mark Wasemiller

Technical Representative (Print/Sign Name)

11/12/93

Date

N/A

Quality Assurance (Print/Sign Name)

Date

015A

9713512.1994

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	<u>E</u>
PROJECT: <u>200-UR-2</u>			DATA PACKAGE: <u>B09847-TMA-628</u>		
VALIDATOR: <u>K. Angelos</u>		LAB: <u>TMA/Novcal</u>		DATE: <u>3/22/94</u>	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input checked="" type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input checked="" type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input checked="" type="checkbox"/> <u>Am241/244</u>	<input checked="" type="checkbox"/> <u>Np237</u>	<input checked="" type="checkbox"/> <u>I-129</u>
SAMPLES/MATRIX <u>B09847, B09848</u>					

1. Completeness N/A
 Technical verification forms present? Yes No N/A

Comments: _____

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? Yes No N/A

Calibration check standards NIST traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Comments: _____

4. Blanks N/A

Method blank analyzed? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? 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: Uranium 238 detected in blank and

1309847, 1309848. Results qualified as J

5. Matrix Spikes N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? Yes No N/A

Spike source expired? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

- 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? Yes No N/A
- RPD Values Acceptable? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: *Thorium 228 RPD > 35% results for*
B09847 qualified as J.

9. Field QC Samples 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: _____

10. Holding Times

Are sample holding times acceptable? Yes No N/A
 Comments: _____

11. Results and Detection Limits (Levels D & E) N/A

Results reported for all required sample analyses? Yes No N/A
 Results supported in raw data? Yes No N/A
 Results Acceptable? Yes No N/A
 Transcription/Calculation errors? Yes No N/A
 MDA's meet required detection limits? Yes No N/A
 Transcription/calculation errors? Yes No N/A

Comments: MDA's exceeded RDL's for the following:

Sample	Analyte	MDA	RDL
B09847	Pu 238	0.06	0.05
	Fe 59	0.2	0.05
	Co 58	0.06	0.05
	Eu 155	0.2	0.1

The laboratory reported "J" and "X" qualifiers for samples B09847, and B09848. These qualifiers have been crossed off the laboratory results forms for clarification purposes and are not considered appropriate for radiochemistry validation.

Comments: _____

1. Uranium 238 qualified T in sample
B09847 due to blank contamination
and B09848.

2. Thorium 228 qualified T in sample
B09847 due to duplicate sample
RPD > 35%.

9713512.2000

TMA NORCAL
REPORTING GROUP 7273

N310032-04

Reagent Blank

REAGENT BLANK

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-04
Dept sample id 7273-004

Client sample id Reagent Blank
Material/Matrix SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	1.2	3.6	6	10	U	80A
Gross Beta	Beta	-1.1	2.9	5	10	U	80B
Selenium 79	15758-45-9	0.005	0.007	0.01	10	U	SE
Strontium 90	10098-97-2	-0.30	0.75	0.8	1	U	Y
Technetium 99	14133-76-7	0.088	0.083	0.2	0.5	U	TC
Iodine 129	15046-84-1	0.25	0.69	2	2	U	I
Uranium 233/234		0.028	0.056	0.1	0.3	U	U
Uranium 235	15117-96-1	-0.011	0.023	0.09	0.3	U	U
Uranium 238		0.093	0.056	0.07	0.3	J	U
Total Uranium (ug/g)	7440-61-1	U		0.003	0.1	UX	U T
Plutonium 238	13981-16-3	0.034	0.027	0.04	0.05	U	PU
Plutonium 239/240		0.054	0.034	0.04	0.05		PU
Americium 241	14596-10-2	0.004	0.011	0.02	0.05	U	TP
Curium 244	13981-15-2	0.002	0.011	0.02	0.05	U	TP
GAMMA SCAN ANALYTES							
Sodium 22	13966-32-0	U		0.02		U	GAM
Potassium 40	13966-00-2	U		0.4		U	GAM
Manganese 54	13966-31-9	U		0.01		U	GAM
Iron 59	14596-12-4	U		0.04	0.05	U	GAM
Cobalt 58	13981-38-9	U		0.02	0.05	U	GAM
Cobalt 60	10198-40-0	U		0.02	0.05	U	GAM
Niobium 94	14681-63-1	U		0.02		U	GAM
Ruthenium 103	13968-53-1	U		0.02		U	GAM
Ruthenium 106	13967-48-1	U		0.1		U	GAM
Tin 113	13966-06-8	U		0.02		U	GAM
Cesium 134	13967-70-9	U		0.02		U	GAM
Cesium 137	10045-97-3	U		0.02	0.05	U	GAM
Cerium 144	14762-78-8	U		0.09		U	GAM
Europium 152	14683-23-9	U		0.04	0.1	U	GAM
Europium 154	15585-10-1	U		0.02	0.1	U	GAM

Verified
3/15/94
MMT

Quality assoc. sample
results as
No qual. necessary
for Pu.

REAGENT BLANKS
Page 1
SUMMARY DATA SECTION
Page 9

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.28
Report date 01/07/94

~~016~~

9713512.2001

TMA NORCAL
REPORTING GROUP 7273

N310032-04

Reagent Blank

BLANK, cont.

SDG <u>7273</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310032-04</u>	Client sample id <u>Reagent Blank</u>
Dept sample id <u>7273-004</u>	Material/Matrix <u>SOLID</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Europium 155	14391-16-3	U		0.05	0.1	U	GAM
Radium 226	13982-63-3	U		0.04		U	GAM
Radium 228	15262-20-1	U		0.1		U	GAM
Thorium 228	14274-82-9	U		0.03		U	GAM
Thorium 232	7440-29-1	U		0.1		U	GAM

QC-16149 - 16158

Lab id <u>TMAN</u>
Protocol <u>WHC-HASM</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>2.28</u>
Report date <u>01/07/94</u>

~~017~~

9713512.2002

TMA NORCAL
REPORTING GROUP 7273

N310032-10

Reagent Blank

REAGENT BLANK

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-10
Dept sample id 7273-010

Client sample id Reagent Blank
Material/Matrix SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Neptunium 237	13994-20-2	0.028	0.034	0.04	0.2	U	NP

QC-16872

~~018~~

9713512.2003

TMA NORCAL
REPORTING GROUP 7273

N310032-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-03
Dept sample id 7273-003

Client sample id Lab Control Sample
Material/Matrix SOLID

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	170	17	4	10		80A	179	7.2	95	67-133	80-120
Gross Beta	170	9.5	5	10		80B	188	7.5	90	77-123	80-120
Strontium 90	8.6	3.8	0.9	1		Y	9.42	0.38	91	38-162	80-120
Technetium 99	14	1.1	0.5	0.5		TC	15.3	0.61	92	81-119	80-120
Iodine 129	24	0.89	1	2		I	25.2	1.0	95	83-117	80-120
Uranium 233/234	3.8	0.51	0.3	0.3		U	3.89	0.16	98	78-122	80-120
Uranium 235	2.9	0.43	0.08	0.3		U	2.97	0.24	98	74-126	80-120
Uranium 238	3.9	0.52	0.2	0.3		U	3.87	0.15	101	78-122	80-120
Total Uranium (ug/g)	1.3	0.24	0.03	0.1	X	U_T	1.30	0.052	100	68-132	80-120
Plutonium 238	0.008	0.015	0.03	0.05	U	PU	0	0			80-120
Plutonium 239/240	0.83	0.14	0.04	0.05	B	PU	0.901	0.036	92	75-125	80-120
Americium 241	0.98	0.13	0.04	0.05		TP	0.899	0.036	109	76-124	80-120
Curium 244	0.66	0.10	0.04	0.05		TP	0.666	0.027	99	76-124	80-120
GAMMA SCAN ANALYTES											
Sodium 22	U		0.009		U	GAM					
Potassium 40	U		0.09		U	GAM					
Manganese 54	U		0.01		U	GAM					
Iron 59	U		0.02	0.05	U	GAM					
Cobalt 58	U		0.01	0.05	U	GAM					
Cobalt 60	0.22	0.023		0.05		GAM	0.207	0.008	106	70-130	80-120
Niobium 94	U		0.01		U	GAM					
Ruthenium 103	U		0.009		U	GAM					
Ruthenium 106	U		0.09		U	GAM					
Tin 113	U		0.01		U	GAM					
Cesium 134	U		0.01		U	GAM					
Cesium 137	0.13	0.018		0.05		GAM	0.141	0.006	92	71-129	80-120
Cerium 144	U		0.04		U	GAM					
Europium 152	U		0.02	0.1	U	GAM					
Europium 154	U		0.01	0.1	U	GAM					
Europium 155	U		0.02	0.1	U	GAM					

*Verified
MWS
3/21/94*

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-LCS
Version 2.28
Report date 01/07/94

~~010~~

9713512.2004

TMA NORCAL
REPORTING GROUP 7273

N310032-03

Lab Control Sample

LAB CONTROL SAMPLE, cont.

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-03
Dept sample id 7273-003

Client sample id Lab Control Sample
Material/Matrix SOLID

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Radium 226	U		0.02		U	GAM					
Radium 228	U		0.05		U	GAM					
Thorium 228	U		0.02		U	GAM					
Thorium 232	U		0.05		U	GAM					

QC-16140 - 16148

*Verified
3/21/94*

0.00

Lab id TMAN
Protocol WNC-HASM
Version Ver 1.0
Form DVD-LCS
Version 2.28
Report date 01/07/94

9713512.2005

TMA NORCAL
REPORTING GROUP 7273

N310032-06

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7273
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310032-06
Dept sample id 7273-006

Client sample id Lab Control Sample
Material/Matrix SOLID

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Neptunium 237	2.9	0.48	0.2	0.2		NP	4.10	0.16	71	81-119	80-120

QC-16874

*Recovery < laboratory
limits but within
validation limits
no qualification
necessary*

*Verified
MSA
3/21/94*

~~0 21~~

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-LCS
Version 2.28
Report date 01/07/94

9713512.2006

TMA NORCAL
REPORTING GROUP 7273

N310032-05

B098Y7

DUPLICATE

SDG <u>7273</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
DUPLICATE	ORIGINAL
Lab sample id <u>N310032-05</u>	Lab sample id <u>N310032-01</u>
Dept sample id <u>7273-005</u>	Dept sample id <u>7273-001</u>
	Received <u>10/09/93</u>
	% moisture <u>7.9</u>
	Client sample id <u>B098Y7</u>
	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
	Collected <u>10/07/93</u>
	Chain of custody id <u>EFL-1091</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	10	4.6	4	10		80A	11	4.4	4		10	101	
Gross Beta	18	4.3	5	10		80B	18	4.2	5		0	60	
Selenium 79	0.009	0.009	0.01	10	U	SE	0.008	0.008	0.01	U	-		
Strontium 90	0.11	0.25	0.9	1	U	Y	-0.13	1.1	0.8	U	-		
Technetium 99	-0.54	0.94	0.6	0.5	U	TC	-0.39	0.23	0.2	U	-		
Iodine 129	-0.25	0.75	2	2	UX	I	0.32	0.58	1	U	-		
Uranium 233/234	0.62	0.15	0.07	0.3		U	0.51	0.18	0.1		19	63	
Uranium 235	0.044	0.044	0.08	0.3	U	U	0.060	0.060	0.1	U	-		
Uranium 238	0.57	0.15	0.07	0.3	B	U	0.59	0.18	0.09	B	3	62	
Total Uranium (ug/g)	1.7	0.31	0.03	0.1	X	U_T	1.7	0.31	0.03	X	0	43	
Neptunium 237	-0.004	0.032	0.06	0.2	U	NP	0.008	0.016	0.02	U	-		
Plutonium 238	0.003	0.010	0.02	0.05	U	PU	0.003	0.034	0.06	U	-		
Plutonium 239/240	0.023	0.015	0.02	0.05	BJ	PU	0.020	0.014	0.03	U	14	144	
Americium 241	0.015	0.017	0.03	0.05	U	TP	0.002	0.010	0.02	U	-		
Curium 244	-0.007	0.014	0.03	0.05	U	TP	-0.007	0.007	0.02	U	-		
GAMMA SCAN ANALYTES													
Sodium 22	U		0.1		U	GAM	U		0.06	U	-		
Potassium 40	11	1.8				GAM	13	1.1			17	42	
Manganese 54	U		0.1		U	GAM	U		0.05	U	-		
Iron 59	U		0.4	0.05	U	GAM	U		0.2	U	-		
Cobalt 58	U		0.1	0.05	U	GAM	U		0.06	U	-		
Cobalt 60	U		0.2	0.05	U	GAM	U		0.04	U	-		
Niobium 94	U		0.1		U	GAM	U		0.05	U	-		
Ruthenium 103	U		0.2		U	GAM	U		0.07	U	-		
Ruthenium 106	U		0.9		U	GAM	U		0.4	U	-		
Tin 113	U		0.1		U	GAM	U		0.07	U	-		
Cesium 134	U		0.1		U	GAM	U		0.06	U	-		
Cesium 137	U		0.09	0.05	U	GAM	U		0.05	U	-		

Verified
3/21/94

~~0 22~~

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DUP</u>
Version	<u>2.28</u>
Report date	<u>01/07/94</u>

9713512.2007

TMA NORCAL
REPORTING GROUP 7273

N310032-05

B098Y7

DUPLICATE, cont.

SDG <u>7273</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
DUPLICATE	ORIGINAL
Lab sample id <u>N310032-05</u>	Lab sample id <u>N310032-01</u>
Dept sample id <u>7273-005</u>	Dept sample id <u>7273-001</u>
	Client sample id <u>B098Y7</u>
	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
	Received <u>10/09/93</u>
	Collected <u>10/07/93</u>
% moisture <u>7.9</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Cerium 144	U		0.5		U	GAM	U		0.3	U	-		
Europium 152	U		0.2	0.1	U	GAM	U		0.1	U	-		
Europium 154	U		0.1	0.1	U	GAM	U		0.08	U	-		
Europium 155	U		0.3	0.1	U	GAM	U		0.2	U	-		
Radium 226	0.47	0.20				GAM	0.56	0.11			17	74	
Radium 228	0.67	0.43				GAM	0.89	0.20			28	97	
Thorium 228	0.57	0.13				GAM	0.92	0.072			47	44	
Thorium 232	0.67	0.43				GAM	0.89	0.20			28	97	

QC 16159 - 16168 - 16876

*Thorium²²⁸ RPD > 35%
sample results qualified as J*

*Verified
WHD
3/21/94*

~~0.30~~

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DUP</u>
Version	<u>2.28</u>
Report date	<u>01/07/94</u>

SAMPLE RESULT VERIFICATION: B098Y7-TMA-628

B098Y7-TMA-628					
Gross Alpha/Beta					
Sample ID:	B098Y7	B098Y8	QC-LCS	QC-BLANK	B098Y7-DUP
Detector:	109	110	109	101	102
Aliquot:	0.10	0.10	1.00	1.00	0.10
Count time:	100	100	100	100	100
Alpha cpm:	0.42	0.24	4.46	0.12	0.42
Bkgd:	0.06	0.06	0.06	0.09	0.09
Xtalk:	0.01	0.01	0.01	0.01	0.01
Eff:	0.14	0.13	0.12	0.11	0.14
Result Calc.:	11.28	5.67	16.88	0.12	10.35
Result Rptd:	11.20	5.65	16.90	0.12	10.40
MDA Calc:	3.55	3.99	0.43	0.56	4.37
MDA rptd:	3.55	4.00	0.43	0.55	4.38
Beta cpm:	2.79	2.72	18.19	0.85	2.87
Bkgd:	1.03	1.26	1.04	0.95	1.12
Xtalk:	0.27	0.27	0.28	0.28	0.27
Eff:	0.42	0.42	0.42	0.42	0.42
Result Calc.:	17.78	15.18	17.23	-0.11	17.74
Result Rptd:	17.80	15.20	17.30	-0.11	17.80
MDA Calc:	5.07	5.60	0.51	0.49	5.28
MDA rptd:	5.07	5.61	0.51	0.49	5.29
Selenium 79					
Sample ID:	B098Y7	QC-Blank	B098Y7-DUP		
Detector:	5	5	5		
Gross Counts:	937	920	944		
Count Time:	150	150	150		
Sample Amount:	0.5	0.5	0.5		
Bkgd cpm:	5.69	5.69	5.69		
Decay Factor:	1	1	1		
Detector Eff.:	96.042	98.438	94.976		
Yield:	0.668	0.748	0.6243		
Result Calc.:	0.008	0.005	0.009		
Result Rptd:	0.008	0.005	0.009		
MDA Calc.:	0.013	0.011	0.014		
MDA Rptd.:	0.010	0.010	0.005		
Strontium 90					
Sample ID:	B098Y7	QC-LCS	QC-BLANK	B098Y7-DUP	
Detector:	210	211	212	213	
Bkg:	0.4323	0.6020	0.4552	0.4942	
Count Time:	33.000	33.000	33.000	33.000	
Y90 cpm:	-0.128	8.611	-0.285	0.095	
Elapsed Time, days:	53.555	0.000	0.000	53.555	
Lambda:	6.86E-05	6.86E-05	6.86E-05	6.86E-05	
Decay:	0.9963	1.0000	1.0000	0.9963	
Yield:	0.8152	0.8414	0.8038	0.7500	
PPT. corr.:	1	1	1	1	
Aliquot:	1	1	1	1	
Product:	0.8122	0.8414	0.8038	0.7472	
C-zero:	-0.1576	10.2341	-0.3546	0.1271	
P-Factor:	1.859	1.859	1.859	1.859	
Result, calc.:	-0.132	8.570	-0.297	0.106	
Result, rptd.:	-0.058	8.600	-0.300	0.110	
MDA, calc.:	0.805	0.984	0.818	0.792	
MDA, rptd.:	0.809	0.900	0.750	0.900	

SAMPLE RESULT VERIFICATION: B098Y7-TMA-628

Technetium 99						
Sample ID:	B098Y7	B098Y8	QC-LCS	QC-BLANK	B098Y7-DUP	
Detector:	16	9	11	12	15	
Aliquot:	2.000	2.000	2.000	2.000	2.000	
P-Factor:	2.340	2.340	2.340	2.340	2.340	
Yield:	0.408	0.648	0.387	0.469	0.326	
Days:	65.062	62.971	0.000	0.000	62.971	
Lambda:	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	
Net, cpm:	-0.300	-0.270	10.480	0.080	-0.330	
Count, time:	496.400	483.000	112.500	483.000	112.500	
Bkg., cpm:	0.570	0.540	0.500	0.560	0.650	
Result, calc.:	-0.388	-0.220	14.257	0.090	-0.534	
Result, rptd.:	-0.390	-0.220	14.000	0.088	-0.540	
MDA, calc.:	0.204	0.127	0.423	0.178	0.573	
MDA, rptd.:	0.200	0.100	0.500	0.200	0.600	
					Calc	Rslt From
Total Uranium	Standard	Intensity	Sample ID	Intens.	Result	Raw Data
	0.049	534	B098Y7	16962	1.942	2.130
	0.156	1346	B098Y8	10407	1.192	1.296
	0.521	4460	QC-LCS	14870	1.703	1.652
	0.976	8440	QC-BLANK	50	0.006	0.036
	2.603	21956				
	4.881	41542				
	16.27	129728				
Slope Factor:	1.15E-04					
Uranium 233/4/5/8						
Sample ID:	B098Y7	B098Y8	QC-LCS	QC-BLANK	B098Y7-DUP	
Detector:	19	20	19	24	26	
Sample count time:	151.23	151.23	208.52	208.52	208.52	
Corr. tracer dpm:	10.47	10.47	10.47	10.47	10.47	
Bkgd count time:	2559.45	2559.45	2559.45	2559.45	2559.45	
Net tracer counts:	383	316	526	507	521	
Detector eff.:	0.2626	0.2648	0.2637	0.3159	0.2836	
Yield:	0.921	0.754	0.914	0.735	0.841	
Aliquot:	1	1	1	1	1	
U-238, gross counts:	49	40	462	10	63	
U-238, bkgd counts:	1	0	28	0	0	
U-235, gross counts:	4	1	269	0	4	
U-235, bkgd counts:	0	0	1	1	0	
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	
U-233/4, gross counts:	45	32	453	7	70	
U-233/4, bkgd counts:	3	1	32	4	2	
U-238, result calc.:	0.591	0.597	3.891	0.093	0.570	
U-238, result rptd.:	0.590	0.600	3.900	0.093	0.570	
U-238 MDA calc.:	0.094	0.114	0.221	0.071	0.069	
U-238, MDA rptd.:	0.090	0.100	0.200	0.070	0.070	
U-235, result calc.:	0.060	0.018	2.909	-0.011	0.044	
U-235, result rptd.:	0.060	0.018	2.900	-0.011	0.047	
U-235, MDA calc.:	0.114	0.139	0.083	0.086	0.084	
U-235, MDA rptd.:	0.100	0.100	0.080	0.090	0.080	
U-233/4, result calc.:	0.517	0.463	3.775	0.028	0.616	
U-233/4, result rptd.:	0.510	0.460	3.800	0.028	0.620	
U-233/4, MDA calc.:	0.099	0.114	0.236	0.087	0.069	
U-233/4, MDA rptd.:	0.100	0.100	0.300	0.100	0.070	

SAMPLE RESULT VERIFICATION: B098Y7-TMA-628

Plutonium 238/9				
Sample ID:	B098Y7	QC-LCS	QC-BLANK	B098Y7-DUP
Detector:	49	63	53	26
Count time:	983.7	1229.65	1259.47	1007.92
Corr, tracer dpm:	4.86	4.86	4.86	4.86
Bkgd, count time:	2588.68	2857.7	2380.13	2588.68
Net, tracer counts:	645	567	645	645
Detector Eff:	0.3681	0.3923	0.3877	0.3681
Yield:	0.367	0.242	0.272	0.358
Aliquot:	1	1	1	1
Pu239, gross counts:	6	218	19	6
Pu239, bkgd counts:	0	3	3	0
Pu239 decay:	1	1	1	1
Pu238, gross counts:	11	3	13	3
Pu238, bkgd counts:	10	1	3	2
Pu238 decay:	0.999	1	1	0.9986
Pu239, Result calc.:	0.020	0.830	0.054	0.020
Pu239, Result rptd.:	0.020	0.830	0.054	0.023
Pu239, MDA calc.:	0.026	0.031	0.027	0.026
Pu239, MDA rptd.:	0.030	0.040	0.040	0.020
Pu238, Result calc.:	0.003	0.008	0.034	0.003
Pu238, Result rptd.:	0.003	0.008	0.034	0.003
Pu238, MDA calc.:	0.050	0.030	0.027	0.026
Pu238, MDA rptd.:	0.060	0.030	0.040	0.020
Americium/Curium				
Sample ID:	B098Y7	QC-LCS	QC-BLANK	B098Y7-DUP
Detector:	66	47	48	49
Count Time:	862.45	865.78	865.78	865.78
Tracer dpm:	4.95	4.95	4.95	4.95
Bkgd count time:	2380.13	2382.02	2382.02	2382.02
Net tracer counts:	1276	748	1243	1306
Detector eff.:	0.4068	0.3607	0.3815	0.3661
Yield:	0.735	0.484	0.760	0.832
Aliquot:	1	1	1	1
Am241 gross counts:	5	336	8	18
Am241 bkgd. counts:	4	7	6	9
Am241 decay:	0.9997	1	1	0.9997
Cm244 gross counts:	0	229	6	7
Cm244 bkgd counts:	4	7	5	11
Cm244 decay:	0.9925	1	1	0.9925
Am241 result calc.:	0.002	0.981	0.004	0.015
Am241 result rptd.:	0.002	0.980	0.004	0.015
Am241 MDA calc.:	0.016	0.037	0.020	0.024
Am241 MDA rptd.:	0.020	0.040	0.020	0.030
Cm244 result calc.:	-0.007	0.662	0.002	-0.007
Cm244 result rptd.:	-0.007	0.660	0.002	-0.007
Cm244 MDA calc.:	0.016	0.037	0.019	0.027
Cm244 MDA rptd.:	0.020	0.040	0.020	0.030

SAMPLE RESULT VERIFICATION: B098Y7-TMA-628

Neptunium				
Sample ID:	B098Y7	B098Y7-DUP	QC-LCS	QC-BLANK
Detector:	201	202	203	204
Np239 cpm:	20.28	25.96	4.71	11.01
Inst. eff.:	0.721	0.721	0.721	0.721
Am243 added:	99.08	99.08	99.08	99.08
Yield:	2.84E-01	3.63E-01	6.59E-02	1.54E-01
Aliquot:	6.40E-01	6.37E-01	1	1
Count time:	777.98	1224.8	1224.8	1277.3
Np237 gross counts:	1	7	213	6
Np237 bkgd counts:	0	8	9	1
Np237 aspec. eff.:	0.386	0.401	0.399	0.402
Np237 result calc.:	0.018	-0.009	6.331	0.063
Np237 result rptd.:	0.018	-0.009	6.332	0.063
Np237 MDA calc.:	0.063	0.052	0.195	0.044
Np237 MDA rptd.:	0.025	0.064	0.237	0.044
Iodine 129				
Sample ID:	B098Y7	QC-LCS	QC-BLANK	
Detector:	XSPEC14	XSPEC14	XSPEC14	
Count Time:	561.83	478.77	379.3	
Gross cpm:	0.491	11.298	0.533	
Bkg cpm:	0.441	0.78	0.496	
Blank cpm:	-0.058	-0.058	-0.058	
Net cpm:	0.108	10.576	0.095	
Lambda:	1.00E-99	1.00E-99	1.00E-99	
Corr. Days:	57.052	0	0	
Decay:	0.5	1	1	
Yield:	0.7069	0.9139	0.7662	
Aliquot:	2	1	1	
PPT. Corr.:	1	1	1	
Product:	7.07E-01	9.14E-01	7.66E-01	
P-factor:	4.57E+00	4.57E+00	4.57E+00	
Result Calc.:	0.315	23.822	0.255	
Result Rptd.:	0.315	23.800	0.255	
MDA Calc.:	0.040	0.424	0.054	
MDA Rptd.:	1.298	1.321	1.556	