TMA START 9713510038
Thermo Analytical Inc.

B06 M50-TMA.221
0046222
306

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

AUG 1992
RECEIVED
OSM DMO

August 28, 1992

RECORD COPY

Briana Colley
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Reference: Metals Case N2-06-164 & Nitrate/Nitrite
WHC Sample B06M50

Dear Briana:

This will confirm that the WHC sample identification number on the above metals case should read B06M50 instead of B06M5D.

Sincerely,

Dolores Sanchez
Program Coordinator

1 JAN 1997
RECEIVED
EDMC

B06M5D-TMA-221

9213612.0039

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: CM Chance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 6-25-92

Ice Chest No.: SML-77

Field Logbook No.: EFL-1021

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M5D
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,~~1000ml~~ 950 aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241 CC 6-25-92

2)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 6-25-92

3)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

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

Relinquished by:	Received by:	Date/Time:
CM Chance / Cory Chance	Hermit Blum	6-29-92 0800 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received @ TMA/NORCAL 6-27-92 @ 1300; opened 6-29-92. KB

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

9216172.0030

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: CM Chance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 6-29-92

Ice Chest No.: SML-113

Field Logbook No.: EFL-1021

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M57
1,120ml aG:CLP;ICP/AA Metals,Hg
1,120ml aG:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

2)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

3)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 6-29-92

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

Relinquished by:	Received by:	Date/Time:
CM Chance Cory Chance	Kermit Blum	7-6-92 0800 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received 7-2-92 @ 1735 @ TMA/Norcal (after regular work hours). Opened 7-6-92. KB

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

9215017.0041

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector CM Chance Date 6-29-92

Company Contact CM CHANCE Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M57	S	6-29-92	0852	1-120ml aG CLP;ICP/AA Metals,Hg 1-120ml aG CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
CC		6-29-92		

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

A-6000-406 (06/91) WEF060

9213517.0042

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: CMChance

Company Contact: CM CHANCE — Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4 — Collection Date: 7-7-92

Ice Chest No.: — Field Logbook No.: EFL-1022

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M33
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,~~1000ml~~ 950 aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241 CC 7-7-92

2) B06M34
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,~~1000ml~~ 950 aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241 CC 7-7-92

3)
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 7-7-92

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

Relinquished by:	Received by:	Date/Time:
CMChance Cory Chance	Kermit Blum	7-9-92 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9213517.0043

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector C M Chance Date 7-7-92

Company Contact CM CHANCE Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M33	S	7-7-92	0735	1-120ml aG CLP;ICP/AA Metals,Hg 1-120ml aG CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-~~1000~~ml aG Gross alpha/beta,Gamma Spec,Sr-90,C-14 950 CC 7-7-92 U-235/238,Pu-239/240,Am-241
B06M34	S	7-7-92	0925	1-120ml aG CLP;ICP/AA Metals,Hg 1-120ml aG CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-~~1000~~ml aG Gross alpha/beta,Gamma Spec,Sr-90,C-14 950 CC 7-7-92 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
CC 7-7-92				

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

A-6000-406 (06/91) WEF060

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector CM Chance
Company Contact CM CHANCE

Date ~~6-26-92~~ 6-25-92 CC 6-25-92
Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M50	S	6-25-92	1350	1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-~~1000ml~~ 950 aG CC 6-25-92 Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
		CC 6-25-92		

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

A-6000-406 (06/91) WEF060

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper [X] Bill to Consignee ☐ Third Party Billing ☐

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day ☐ AM ☐ PM ☐ Second Day ☐ Saturday Delivery [X]

INTERNATIONAL: Express ☐ Preferred ✓ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

E Shipper's Account Number: 850281585

Date: 06-26-92 Origin: PSX Shipment Number: 250986901 0

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA
Canada ☐
Customer's Reference Numbers: W12200 PB7Ae W92-0-0436#18
Zip: 99352

To:
ROBERT FOX
TMA/NORCAL
2030 WRIGHT AVE
RICHMOND CA
Hold for Pick Up ☐
Canada ☐
E Consignee's Account Number
Zip: 94804

Tariff Dest. | Gateway

Check to Shipper $

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

FOR INFORMATION OR RATES CALL 1-800-044 EMERY (1-800-443-6379)

Declared Value $

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
1 IGLOO POLYCOOLER SMI-77 SOIL SAMPLES B06M50 W92-0-0436#18	1	16	11		1	53

250986901 0

Remarks: SATURDAY DELIVERY

Shipper's Signature X

Zip Ship ☐
For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used
Urgent Letter 9X12 ☒ Urgent Pack 12X15 ☒

International Shipments: Free Domicile ☐ Commodity Code

Third Party Account Number mandatory for Third Party Billing. E Third Party Account Number

International Customs Value | International Insurance

Base Charge

Total Transportation Charges | Other Charges/Advance at Origin ☐ OC/AO- $

1-OAK SA 1

Terms and Conditions on Back

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper ☒ Bill to Consignee ☐ Third Party Billing ☐

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day ☐ AM ☐ PM ☐ Second Day ☒ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

E Shipper's Account Number: 850281585

Date: 7/1/92 | Origin: PSC | Shipment Number: 250986832 8

From:
WESTINGHOUSE SHIPPING DEJPT (509) 376-6665
US DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA
Canada ☐

To:
TMA NORCAL
TMA NORCAL
2030 WRIGHT AVE
RICHMOND CA 94804
Hold for Pick Up ☐ Canada ☐

Tariff Dest. | Gateway

Check to Shipper $

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Customer's Reference Numbers: PB7AE W 12200 W92-0-0438 1999352

E Consignee's Account Number

FOR INFORMATION OR RATES CALL 1-800-44-EMERY (1-800-443-6379)

Declared Value $

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
SOIL & SAMPLES COOLER ID# SML-113	1				1	52

Rec'd 7-2-92 5 P.M. R. Mitchell

250986832 8

Remarks: OVERNIGHT DELIVERY

Shipper's Signature X

Zip Ship ☐ — For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used: Urgent Letter 9X12 ☒ Urgent Pack 12X15 ☒

International Shipments: Free Domicile ☐ Commodity Code

Third Party Account Number mandatory for Third Party Billing. E Third Party Account Number

International Customs Value | International Insurance

Base Charge

Total Transportation Charges | Other Charges | Advance at Origin $

10AK-A

Terms and Conditions on Back

97135117.0046

9713517.0047

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 2521035112

2128M 2521035112

RECIPIENT'S COPY

1 Date 7/6/92

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (510) 235-2633

Company: T M A /NORCAL

Department/Floor No.

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 9 4 8 0 4

2 To (Recipient's Name) Please Print: SAMPLE CONTROL

Recipient's Phone Number (Very Important): (617) 890-7200

Company: T M A / SKINNER & SHERMAN

Department/Floor No.

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

City: WALTHAM State: MA ZIP Required: 02254

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2320-6406

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

Street Address

City State ZIP Required

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

4 SERVICES (Check only one box)

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

Standard Overnight (Delivery by next business afternoon†)
- 51 [X] YOUR PACKAGING
- 56 [ ] FEDEX LETTER *
- 52 [ ] FEDEX PAK *
- 53 [ ] FEDEX BOX
- 54 [ ] FEDEX TUBE

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

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

Freight Service (for Extra Large or any package over 150 lbs.)
- 70 [ ] OVERNIGHT FREIGHT ** (Confirmed reservation required)
- 80 [ ] TWO-DAY FREIGHT **

† Delivery commitment may be later in some areas. *Declared Value Limit $100. **Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 [ ] HOLD FOR PICK-UP (Fill in Box H)
- 2 [X] DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
- 4 [ ] DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 [ ] SATURDAY PICK-UP (Extra charge)
- 10 [ ]
- 11 [ ] DESCRIPTION
- 12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT in Pounds Only	YOUR DECLARED VALUE
Total	Total 1 9	Total

DIM SHIPMENT (Chargeable Weight) [ ] ____ lbs.

L x W x H =

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

Emp. No. Date

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

Street Address

City State Zip

Received By: X

Date/Time Received 7/7/92 FedEx Employee Number 9:30

7 Release Signature:

FedEx Emp. No. Date/Time

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

REVISION DATE 4/91 PART #137204 FXEM 4/92 FORMAT #099

099

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9715517.0048

SATURDAY DELIVERY

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
Westinghouse Hanford Co.		W92-0-0436 #18

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Geotech	EFSG	Env.Charc.& Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing Air Emery ☒ Contractor ☐ Vendor

Shipped to TMA7NORCAL
2030 Wright Ave
Richmond Ca. 94804

Off-site Custodian: Robert Fox

Full Title:

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
53 lbs	Igloo SML poly cooler. Contains soil samples that are double-bagged and packed in wet ice and vermiculite. Samples are nonhazardous. Sample # B06M50	NA

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

Necessity for the Off-Site Use of this Property

To support drilling and sampling at the 100 Areas.

Bill of Lading: PSC 250986-7010

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

RM Clearance for Public Release	RM Survey No.	Date
	[illegible]	6-26-92

Location of Property (Area & Bldg.)	Contact	Phone
100 Area 100KR-4	CM CHANCE	3767619

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
6-26-92	PB7AE 12200	NA

Originated By	Date	Authorized By	Date
Relinquished by: Cory Chance	6-26-92	[illegible]	6-26-92

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	6/26/92

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
[illegible]				
Date [illegible]				

DISTRIBUTION

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

54-3000-479 (09/89)

Overnight Delivery

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
Westinghouse Hanford Co.		W92-0-0436 #19

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng & Geotech	EFSG	Env. Charc & Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing Air Emery ☒ Contractor ☐ Vendor

Shipped to TMA/NORCAL
2030 Wright Ave.
Richmond Ca. 94804

Off-site Custodian: Robert Fox

Full Title:

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
6-30-92 ~~43 lbs~~ 52 lbs	SMC-113 poly cooler. Contains soil samples that are double-bagged and packed in wet ice and vermiculite. Samples are nonhazardous. Sample #: ~~B06M56~~ 6-30-92 B06M57	NA

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

Necessity for the Off-Site Use of this Property

To support drilling and sampling at the 100 Areas.

Bill of Lading: 250 [illegible]

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

RM Clearance for Public Release	RM Survey No. [illegible]	Date 7-1-92
Location of Property (Area & Bldg.) 100 Areas 100 KR-[illegible]	Contact CM CHANCE	Phone 376-7619
Date Ready for Shipment ~~6-30-92~~ 7-1-92	Cost Code to be Charged PBAAE 12200	Approximate Date This Property will be Returned NA
Originated By Relinquished by: Cory C. Michael	Date 7-1-92 ~~6-30-92~~	Authorized By J.W. Lyon — Date 6-30-92
Signature and Name of Property Control	Custodian Date	Property Management Approval — Date 7/1/92

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date [illegible]				

DISTRIBUTION

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

54-3000-479 (09/89)

9713517.0050

Overnight Delivery

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
Westinghouse Hanford Company		W92-0-0436 #23

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env Eng & Geotech	EFSG	Env Charac & Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing Air EMERY ☒ Contractor ☐ Vendor

Shipped to
TMA/NORCAL
2030 WRIGHT AVE
RICHMOND CA 94804

Off-site Custodian: Robert Fox

Full Title: Project Coordinator

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
48 lbs	Hubbard (MIL-127) poly cooler. Contains soil samples that are double-bagged and packed in wet ice and vermiculite. Samples are nonhazardous. Sample #: B0HM33, B0HM34	

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

Necessity for the Off-Site Use of this Property

To support drilling and sampling at the 100 Areas

Bill of Lading: PSC 250 986 8929

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

RM Clearance for Public Release	RM Survey No.	Date

Location of Property (Area & Bldg.)	Contact	Phone
100 Area 100KR-4	C. M. Chance	376-7619

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
7-8-92	PB7AE 12200	N/A

Originated By	Date	Authorized By	Date
Relinquished by:	7-8-92		7/8/92
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
			7/9/92

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date 7-9-92				

DISTRIBUTION

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

54-3000-479 (09/89)

TMA/Norcal
OFF-HOUR RECEIVING OF EPA/CLP SAMPLES

Form: SCP-6-2
Rev. No. 01
Rev. Date: 7/29/91
Page No. _____

CONTAINER ID	RECEIVED		RELINQUISHED		TRANSPORTATION MODE	AIR BILL #	CONTAINER CONDITION		CONTAINER SEAL		HOLDING LOCATION
	DATE	TIME	DATE	TIME			INTACT	NOT INTACT	INTACT	NOT INTACT	
Red cooler.	DATE 6-27-91	TIME 1:00	DATE ~~6-27-91~~	TIME ~~1:00~~ 0805	EMERY	850-281-585	X		X		Refrig at 6.
	BY B. Stpz.		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								
	DATE	TIME	DATE	TIME							
	BY		BY								

9713517.0052

Icechest Temperature Log

Use one form per shipment.
Refer to Thermometer Correction Log for correction factor.

Customer: HANFORD Date: 6·29·92

icechest # or description	thermometer reading	thermometer number	correction factor	actual temperature *
SAL-77	5°	#110	0	5°

* After 20 minutes if thermometer is not already present.
Temperature is in degrees centigrade.

Technician:_____

ICETEMP.TXT

9715517.0053

Icechest Temperature Log

Use one form per shipment.
Refer to Thermometer Correction Log for correction factor.

Customer: Hanford Date: 7/6/92

icechest # or description	thermometer reading	thermometer number	correction factor	actual temperature *
SML-113	3c	#110	0	3c

* After 20 minutes if thermometer is not already present.
Temperature is in degrees centigrade.

Technician:_____

ICETEMP.TXT

9713517.0054

Icechest Temperature Log

Use one form per shipment.
Refer to Thermometer Correction Log for correction factor.

Customer: HANFORD Date: 7-9-92

icechest # or description	thermometer reading	thermometer number	correction factor	actual temperature *
SML-127	3C	#106	+1	4C

* After 20 minutes if thermometer is not already present.
Temperature is in degrees centigrade.

Technician:_____

ICETEMP.TXT

GENERAL CHEMISTRY RESULTS

CASE NO. 07-016

Soil Sample #:

B06M33
B06M34

CASE NARRATIVE

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

Ernesto Vazquez

Ernesto Vazquez

9215512.0056

TMA Inc. REPORT Work Order # A2-07-016

Received: 07/09/92 Results by Sample

SAMPLE ID B06M33 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 07/07/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	2	mg/Kg	1.0
Sulfate	300.0	44	mg/Kg	10

FORM I

TMA Inc. REPORT Work Order # A2-07-016

Received: 07/09/92

Results by Sample

SAMPLE ID B06M34 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 07/07/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	2	mg/Kg	1.0
Sulfate	300.0	48	mg/Kg	10

FORM I

TMA Inc. REPORT Work Order # A2-07-016

Received: 07/09/92

Results by Sample

SAMPLE ID B06M34 Duplicate FRACTION 02F TEST CODE WCQCD NAME Quality Control Summary

Date & Time Collected 07/07/92 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
Fluoride	B06M34	2.1	2.3	9.1
Sulfate	B06M34	48	46	4.3

FORM VI

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 07-016

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : July 9, 1992

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.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B06M33	A2-07-016-01A	V	SOIL
B06M33 MS	A2-07-016-01B	V	SOIL
B06M33 MSD	A2-07-016-01C	V	SOIL
B06M33	A2-07-016-01D	SV & P	SOIL
B06M34	A2-07-016-02A	V	SOIL
B06M34	A2-07-016-02B	SV & P	SOIL
B06M34 MS	A2-07-016-02C	SV & P	SOIL
B06M34 MSD	A2-07-016-02D	SV & P	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

The samples were received unbroken and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. 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 8/5/92 and was analyzed in accordance with the EPA CLP SOW. The sequence met all of the QC limits specified in the CLP SOW.

The Chromatograms are presented in the manner consistent with the capabilities of the Nelson 2600 Data System which normalizes the largest peak to scale.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. All of the QC results were within the limits specified by the EPA CLP SOW.

We certify that this data package is in compliance with the termsand 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
CLP Program Manager

Widayat
Wida Ang
Organics Supervisor

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M33

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R03

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: not dec. 2 Date Analyzed: 07/14/92

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

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

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

EPA SAMPLE NO.

B06M35

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R03

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: not dec. 2 Date Analyzed: 07/14/92

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.	SUBST. ALKANE	29.33	10	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R06

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: not dec. 4 Date Analyzed: 07/14/92

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	J
67-64-1	Acetone	25	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	7	J
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	2	J
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R06

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: not dec. 4 Date Analyzed: 07/14/92

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

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

000009
EPA SAMPLE NO.

B06M33

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 20727N07

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 2 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	800	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M33

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 20727N07

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 2 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

IF

000011
EPA SAMPLE NO.

B06M33

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 20727N07

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 2 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

Number TICs found: 13

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Ketone	4.22	470	BJ
2.	Unknown Alkene	4.92	170	BJ
3.	Unknown Hydrocarbon	5.57	100	BJ
4.	Unknown Hydrocarbon	5.75	130	BJ
5.	Unknown Hydrocarbon	5.82	130	BJ
6.	Unknown Hydrocarbon	6.15	3000	BJ
7.	Unknown Hydrocarbon	6.80	32000	BJ
8.	Unknown Alkane	6.88	300	J
9.	Unknown Hydrocarbon	7.00	300	BJ
10.	Unknown Hydrocarbon	7.47	66	J
11.	Unknown Hydrocarbon	8.05	1100	BJ
12.	Unknown Hydrocarbon	9.42	170	BJ
13.	Unknown Alcohol	9.80	66	BJ

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 20727N08

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 4 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

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) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 20727N08

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 4 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

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) UG/KG	Q
100-02-7	4-Nitrophenol	830	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	830	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	53	BJ
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
218-01-9	Chrysene	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 20727N08

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 4 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 13

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Ketone	4.22	310	BJ
2.	Unknown Alkene	4.92	170	BJ
3.	Unknown Hydrocarbon	5.57	170	J
4.	Unknown Hydrocarbon	5.75	140	BJ
5.	Unknown Hydrocarbon	5.82	140	BJ
6.	Unknown Hydrocarbon	6.15	3000	BJ
7.	Unknown Hydrocarbon	6.25	1800	BJ
8.	Unknown Hydrocarbon	6.87	47000	BJ
9.	Unknown Hydrocarbon	7.02	310	BJ
10.	Unknown Hydrocarbon	7.48	170	J
11.	Unknown Hydrocarbon	8.08	1700	BJ
12.	Unknown Ketone	8.47	100	BJ
13.	Unknown Ketone	8.58	280	BJ

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M33

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

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

% Moisture: 2 decanted: (Y/N) N Date Received: 07/09/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 07/15/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 08/06/92

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 9.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-36-3	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

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

% Moisture: 4 decanted: (Y/N) N Date Received: 07/09/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 07/15/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 08/06/92

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH: 9.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	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	3.4	U
72-55-9	4,4'-DDE	3.4	U
72-20-8	Endrin	3.4	U
33213-65-9	Endosulfan II	3.4	U
72-54-8	4,4'-DDD	3.4	U
1031-07-8	Endosulfan sulfate	3.4	U
50-29-3	4,4'-DDT	3.4	U
72-43-5	Methoxychlor	18	U
53494-70-5	Endrin ketone	3.4	U
7421-36-3	Endrin aldehyde	3.4	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	34	U
11104-28-2	Aroclor-1221	69	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

9713517.0074

 Skinner&Sherman REPORT Work Order # S2-07-058

Received: 07/10/92 08/13/92 12:54:36

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

ATTEN Dan Steurmer

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

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

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N2-07-034
TAKEN By Client
TRANS Fedex # 2521035064
TYPE 1 Soil (NO3NO2)
P.O. # N2-07-034
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B06M33
01 B06M33D
01 B06M33S
02 B06M34
03 LCSS

TEST CODES and NAMES used on this workorder

NO3NO2 Nitrate Plus Nitrite

TMA Thermo Analytical Inc.

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

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

9713517.0075

 Skinner&Sherman REPORT Work Order # S2-07-058

Received: 07/10/92 Results by Sample

SAMPLE ID B06M33 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 07/07/92 07:35:00 Category SOIL

NO3NO2 3.24
mg N/kg

SAMPLE ID B06M33D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 07/07/92 07:35:00 Category SOIL

NO3NO2 <2.49
mg N/kg

SAMPLE ID B06M33S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 07/07/92 07:35:00 Category SOIL

NO3NO2 20.7
mg N/kg

SAMPLE ID B06M34 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 07/07/92 09:25:00 Category SOIL

NO3NO2 <2.42
mg N/kg

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

NO3NO2 1.92
mg N/L

TMA
Thermo Analytical Inc.

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

TMA/NORCAL

QUALITY CONTROL

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S207058-01	3.24 mg/kg	19.9 mg/kg	20.7 mg/kg	87.7

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S207058-01	3.24 mg/kg	<2.49 mg/kg	200

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	1.92 mg/L	96.0
Prep Blank		<0.25 mg/L	

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

9713517.0032

 Skinner&Sherman REPORT Work Order # S2-07-058

Received: 07/10/92 Test Methodology

TEST CODE NO3NO2 NAME Nitrate Plus Nitrite

Methods for Chemical Analysis of Water and Wastes

EPA - 600/4-79-020 March 1979 Method 353.2 (modified)

TMA
Thermo Analytical Inc.

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

9213517.0078

TMA
Thermo Analytical Inc.

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

August 12, 1992

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

Quality Control Narrative

Scope

Two (2) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on July 10, 1992 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP Target Analyte List metals and cyanide. The analysis were performed under TMA/Skinner and Sherman work order S207057.

Methodology

The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion

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

The antimony, lead, and cyanide digestion spike recovery exceeded the control limit requirements.

The zinc ICP serial dilution 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.

David N. Peterson
Assistant Laboratory Manager

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-034 SAS No.: SDG No.: B06M33

SOW No.: 7/88

SAMPLE NUMBER:	Lab Sample ID.
B06M33	07057-01S
B06M33D	07057-01S2
B06M33S	07057-01DS
B06M34	07057-02S

Were ICP interelement corrections applied? Yes/No YES
Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

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

Signature: Name: David N. Peterson

Date: 8/11/92 Title: Asst. Laboratory Manager

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B06M33

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-034SAS No.: SDG No.: B06M33

Matrix (soil/water): SOIL Lab Sample ID: 07057-01S

Level (low/med): LOW Date Received: 07/10/92

% Solids: 96.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6380.00			P
7440-36-0	Antimony	3.30	U	N	P
7440-38-2	Arsenic	1.20	B		F
7440-39-3	Barium	65.90			P
7440-41-7	Beryllium	0.14	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	4300.00			P
7440-47-3	Chromium	11.20			P
7440-48-4	Cobalt	6.80	B		P
7440-50-8	Copper	16.50			P
7439-89-6	Iron	14900.00			P
7439-92-1	Lead	4.10		N	F
7439-95-4	Magnesium	3730.00			P
7439-96-5	Manganese	263.00			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.50			P
7440-09-7	Potassium	945.00	B		P
7782-49-2	Selenium	0.63	U	W	F
7440-22-4	Silver	0.96	U		P
7440-23-5	Sodium	271.00	B		P
7440-28-0	Thallium	0.88	U		F
7440-62-2	Vanadium	29.50			P
7440-66-6	Zinc	39.60		E	P
	Cyanide	0.52	U	N	CA

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B06M34

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-034SAS No.: SDG No.: B06M33

Matrix (soil/water): SOIL Lab Sample ID: 07057-02S

Level (low/med): LOW Date Received: 07/10/92

% Solids: 98.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7700.00			P
7440-36-0	Antimony	3.20	U	N	P
7440-38-2	Arsenic	0.93	B		F
7440-39-3	Barium	85.00			P
7440-41-7	Beryllium	0.14	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	3730.00			P
7440-47-3	Chromium	21.20			P
7440-48-4	Cobalt	7.10	B		P
7440-50-8	Copper	20.50			P
7439-89-6	Iron	11700.00			P
7439-92-1	Lead	2.80		N	F
7439-95-4	Magnesium	4060.00			P
7439-96-5	Manganese	210.00			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	15.50			P
7440-09-7	Potassium	965.00	B		P
7782-49-2	Selenium	0.60	U	W	F
7440-22-4	Silver	0.95	U		P
7440-23-5	Sodium	509.00	B		P
7440-28-0	Thallium	0.83	U	W	F
7440-62-2	Vanadium	23.20			P
7440-66-6	Zinc	28.00		E	P
	Cyanide	0.51	U	N	CA

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:

FORM I - IN Rev.6/89

WESTINGHOUSE/HANFORD

6
DUPLICATES

SAMPLE NUMBER: B06M33D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-034 SAS No.: SDG No.: B06M33

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

% Solids for Sample: 96.0 % Solids for Duplicate: 96.1

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		6379.8077		5903.8162		7.8		P
Antimony		3.2652	U	3.1737	U			P
Arsenic		1.1746	B	0.9802	B	18.0		F
Barium	40.1	65.8614		68.8960		4.5		P
Beryllium		0.1402	U	0.1363	U			P
Cadmium		0.3005	U	0.2921	U			P
Calcium	1001.6	4300.8814		4031.3474		6.5		P
Chromium		11.2360		10.6854		5.0		P
Cobalt		6.8329	B	7.6850	B	11.7		P
Copper	5.0	16.5304		12.4786		27.9		P
Iron		14872.3958		15381.0358		3.4		P
Lead		4.0985		3.8546		6.1		F
Magnesium	1001.6	3729.5673		3539.5249		5.2		P
Manganese		262.7204		277.7064		5.5		P
Mercury		0.0453	U	0.0473	U			CV
Nickel	8.0	10.5469		9.2835		12.7		P
Potassium		945.2724	B	891.2773	B	5.9		P
Selenium		0.6332	U	2.9900	U			F
Silver		0.9615	U	0.9346	U			P
Sodium		270.8333	B	248.2866	B	8.7		P
Thallium		0.8783	U	0.8295	U			F
Vanadium	10.0	29.4952		31.4603		6.4		P
Zinc		39.5633		39.9260		0.9		P
Cyanide		0.5157	U	0.5106	U			CA

FORM VI - IN Rev.6/89

GENERAL CHEMISTRY RESULTS

CASE NO. 06-084

Soil Sample #:

B06M50

CASE NARRATIVE

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

Ernesto Vazquez

Ernesto Vazquez

TMA Inc. REPORT Work Order # A2-06-084

Received: 06/29/92 Results by Sample

SAMPLE ID B06M50 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 06/25/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	1.8	mg/Kg	1.0
Sulfate	300	37	mg/Kg	10

FORM I

9713517.0085

TMA Inc. REPORT Work Order # A2-06-084

Received: 06/29/92

Results by Sample

SAMPLE ID B06M50 Duplicate FRACTION 01I TEST CODE WCQCD NAME Quality Control Summary

Date & Time Collected 06/25/92 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
Fluoride	B06M50	1.8	2.2	20.0
Sulfate	B06M50	37	37	0.0

FORM VI

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 06-084

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : June 29, 1992

1.0 DESCRIPTION OF CASE :

One soil sample was 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.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B06M50	A2-06-084-01A	V	SOIL
B06M50 MS	A2-06-084-01B	V	SOIL
B06M50 MSD	A2-06-084-01C	V	SOIL
B06M50	A2-06-084-01D	SV & P	SOIL
B06M50 MS	A2-06-084-01E	SV & P	SOIL
B06M50 MSD	A2-06-084-01F	SV & P	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

The samples were received unbroken and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. The MS and MSD samples each had a spike recovery for Acenaphthene within the QC limit; however, they had a % RPD that was above the QC limit. In accordance with protocol, no further action was required.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 7/21/92 and was analyzed in accordance with the EPA CLP SOW. The sequence met all of the QC limits specified in the CLP SOW.

The Chromatograms are presented in the manner consistent with the capabilities of the Nelson 2600 Data System which normalizes the largest peak to scale.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. Samples B06M50 and B06M50MS had TCX surrogate recoveries slightly below the advisory limit on the DB-608 column. In accordance with protocol, no further action was required.

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

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

Nicole Roth
CLP Program Manager

Wida Ang
Organics Supervisor

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20701R03

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: not dec. 8 Date Analyzed: 07/01/92

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	24	B
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	2	J
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

9213517.0090

000006

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20701R03

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: not dec. 8 Date Analyzed: 07/01/92

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	8.25	7	J

9715517.0091

000007

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 20723N07

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: 8 decanted: (Y/N) N Date Extracted: 07/08/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/23/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

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

9213517.0092

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 000008

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 20723N07

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: 8 decanted: (Y/N) N Date Extracted: 07/08/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/23/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	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	64	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

EPA SAMPLE NO.

B06M50

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 20723N07

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: 8 decanted: (Y/N) N Date Extracted: 07/08/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/23/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	4.22	320	BJ
2.	Unknown alkene	4.95	140	BJ
3.	Unknown hydrocarbon	5.62	250	BJ
4.	Unknown alkene	5.80	110	BJ
5.	Unknown alkene	5.87	110	J
6.	Unknown hydrocarbon	6.20	2800	J
7.	Unknown hydrocarbon	6.32	2500	J
8.	Unknown alcohol	6.38	1200	J
9.	Unknown hydrocarbon	6.98	56000	BJ
10.	Unknown alkene	7.10	320	BJ
11.	Unknown alkane	7.25	140	J
12.	Unknown hydrocarbon	7.58	210	BJ
13.	Unknown hydrocarbon	8.18	2400	BJ
14.	Unknown hydrocarbon	8.45	540	J
15.	Unknown ketone	8.57	110	BJ
16.	Unknown ketone	8.68	320	BJ
17.	Unknown alcohol	9.53	570	BJ
18.	Unknown ketone	14.68	72	J

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

000010
EPA SAMPLE NO.

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

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

% Moisture: 8 decanted: (Y/N) N Date Received: 06/29/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 07/06/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/22/92

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

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

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

9713517.0095

 Skinner&Sherman REPORT Work Order # S2-07-018

Received: 06/30/92 07/31/92 15:45:02

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

ATTEN Dan Steurmer

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

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

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

WORK ID N2-06-164
TAKEN By Client
TRANS Fed Ex
TYPE Soil
P.O. # N2-06-164
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 B06M5D
01 B06M5D D
01 B06M5D S
02 LCSS

TEST CODES and NAMES used on this workorder

NO3NO2 Nitrate Plus Nitrite

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

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

9713517.0096

 Skinner&Sherman REPORT Work Order # S2-07-018

Received: 06/30/92 Results by Sample

SAMPLE ID B06M5D SAMPLE # 01 FRACTIONS: A
Date & Time Collected 06/25/92 Category SOIL

NO3NO2 2.56
mg N/kg

SAMPLE ID B06M5D D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 06/25/92 Category SOIL

NO3NO2 2.62
mg N/kg

SAMPLE ID B06M5D S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 06/25/92 Category SOIL

NO3NO2 19.3
mg N/kg

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

NO3NO2 1.92
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

Received: 06/30/92 07/31/92 15:45:02

TMA/NORCAL

QUALITY CONTROL

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S207018-01	2.56 mg/kg	18.6 mg/kg	19.3 mg/kg	90.0

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S207018-01	2.56 mg/kg	2.62 mg/kg	2.3

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	1.92 mg/L	96.0
Prep Blank		<0.25 mg/L	

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. 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 arrangement. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

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

Received: 06/30/92

Test Methodology

TEST CODE NO3NO2 NAME Nitrate Plus Nitrite

Methods for Chemical Analysis of Water and Wastes
EPA - 600/4-79-020 March 1979 Method 353.2 (modified)

TMA
Thermo Analytical Inc.

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

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

9213517.0099

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

AUG 1992
RECEIVED
OSM DMO

August 28, 1992

RECORD COPY

Briana Colley
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Reference: Metals Case N2-06-164 & Nitrate/Nitrite
WHC Sample B06M50

Dear Briana:

This will confirm that the WHC sample identification number on the above metals case should read B06M50 instead of B06M5D.

Sincerely,

Dolores Sanchez
Program Coordinator

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

August 6, 1992

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 June 30, 1992 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP Target Analyte List metals and cyanide. The analysis were performed under Skinner and Sherman work order S207009.

Methodology

The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion

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

The antimony digestion spike recovery exceeded the control limit requirements.

The selenium laboratory duplicates 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.

David N. Peterson
Assistant Laboratory Manager

9213512.0101

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-06-164 SAS No.: SDG No.: B06M5D

SOW No.: 7/88

SAMPLE NUMBER:	Lab Sample ID.
B06M5D	07009-01S
B06M5DD	07009-01S2
B06M5DS	07009-01DS

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

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

Signature: Name: David N. Peterson

Date: 8/05/92 Title: Asst. Laboratory Manager

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B06M5D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-06-164SAS No.: SDG No.: B06M5D

Matrix (soil/water): SOIL Lab Sample ID: 07009-01S

Level (low/med): LOW Date Received: 06/30/92

% Solids: 90.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6200.00			P
7440-36-0	Antimony	3.30	U	N	P
7440-38-2	Arsenic	1.10	B		F
7440-39-3	Barium	63.10			P
7440-41-7	Beryllium	0.31	B		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	6130.00			P
7440-47-3	Chromium	8.60			P
7440-48-4	Cobalt	7.20	B		P
7440-50-8	Copper	17.80			P
7439-89-6	Iron	12400.00			P
7439-92-1	Lead	3.10			F
7439-95-4	Magnesium	3280.00			P
7439-96-5	Manganese	212.00			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	8.50			P
7440-09-7	Potassium	1000.00	B		P
7782-49-2	Selenium	1.80		+*	F
7440-22-4	Silver	0.97	U		P
7440-23-5	Sodium	320.00	B		P
7440-28-0	Thallium	0.33	U		F
7440-62-2	Vanadium	31.60			P
7440-66-6	Zinc	36.50			P
	Cyanide	0.53	U		CA

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

002

9716517.0103

WESTINGHOUSE/HANFORD

6
DUPLICATES

SAMPLE NUMBER:

B06M5DD

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-06-164SAS No.: SDG No.: B06M5D

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

% Solids for Sample: 90.4 % Solids for Duplicate: 91.5

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		6196.3140		5833.5440		6.0		P
Antimony		3.3084	U	3.4345	U			P
Arsenic		1.1378	B	0.7709	B	38.4		F
Barium	40.6	63.0551		63.7716		1.1		P
Beryllium		0.3126	B	0.3118	B	0.3		P
Cadmium		0.3045	U	0.3161	U			P
Calcium		6130.7542		5521.9132		10.4		P
Chromium	2.0	8.6243		8.6705		0.5		P
Cobalt		7.2197	B	6.3506	B	12.8		P
Copper	5.1	17.7803		15.7691		12.0		P
Iron		12409.8807		12244.6271		1.3		P
Lead	0.6	3.0632		2.7944		9.2		F
Magnesium	1014.9	3284.6878		3376.9490		2.8		P
Manganese		212.1052		200.2297		5.8		P
Mercury		0.1006	U	0.1006	U			CV
Nickel	8.1	8.4944		8.8180		3.7		P
Potassium		1004.8713	B	888.1374	B	12.3		P
Selenium	1.0	1.8402		0.7170	B	87.8	*	F
Silver		0.9743	U	1.0114	U			P
Sodium		320.2281	B	422.8824	B	27.6		P
Thallium		0.3308	U	0.3278	U			F
Vanadium	10.1	31.6067		28.0678		11.9		P
Zinc		36.5065		32.9014		10.4		P
Cyanide		0.5318	U	0.5423	U			CA

020

GENERAL CHEMISTRY RESULTS

CASE NO. 07-008

Soil Sample #:

B06M57

CASE NARRATIVE

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

Ernesto Vázquez

Ernesto Vazquez

TMA Inc. REPORT Work Order # A2-07-008

Received: 07/06/92 Results by Sample

SAMPLE ID B06M57 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected 06/29/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	2.2	mg/Kg	1.0
Sulfate	300	40	mg/Kg	10

FORM I

TMA Inc. REPORT Work Order # A2-07-008

Received: 07/06/92 Results by Sample

SAMPLE ID Wet Chemistry Blank FRACTION 02A TEST CODE WCCLPS NAME Anions in Solids - WH232

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	<1.0	mg/Kg	1.0
Sulfate	300	<10	mg/Kg	10

FORM I

TMA Inc. REPORT Work Order # A2-07-008

Received: 07/06/92 Results by Sample

SAMPLE ID B06M57 Duplicate FRACTION 01I TEST CODE WCQCD NAME Quality Control Summary

Date & Time Collected 06/29/92 Category

DUPLICATE QC SUMMARY

ANALYSIS	SAMPLE ID	SAMPLE RESULT	DUPL. RESULT	RPD
Fluoride	B06M57	2.2	2.1	4.7
Sulfate	B06M57	40	38	5.1

FORM VI

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 07-008

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : July 6, 1992

1.0 DESCRIPTION OF CASE :

One soil sample was 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.

2.0 SAMPLE LIST :

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B06M57	A2-07-008-01A	V	SOIL
B06M57 MS	A2-07-008-01B	V	SOIL
B06M57 MSD	A2-07-008-01C	V	SOIL
B06M57	A2-07-008-01D	SV & P	SOIL
B06M57 MS	A2-07-008-01E	SV & P	SOIL
B06M57 MSD	A2-07-008-01F	SV & P	SOIL

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

The samples were received unbroken and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were analyzed by heated purge within the CLP SOW holding times. All of the QC results were within the limits specified by the EPA CLP SOW.

TUNES :

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

3.2.2 SEMIVOLATILE ANALYSIS COMMENTS :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. The MS and MSD samples each had spike recoveries for 1, 4-Dichlorobenzene and 1, 2, 4-Trichlorobenzene within the QC limit; however, they had % RPDs that were above the QC limit for these compounds. In accordance with protocol, no further action was required.

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

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 7/21/92 and was analyzed in accordance with the EPA CLP SOW. The sequence met all of the QC limits specified in the CLP SOW.

The Chromatograms are presented in the manner consistent with the capabilities of the Nelson 2600 Data System which normalizes the largest peak to scale.

SAMPLE NOTES :

LOW LEVEL SOIL :

The samples were extracted and analyzed within the CLP SOW holding times. The matrix spike recoveries were all within the QC limits; however, the % RPD for Heptachlor was above the advisory limit. In accordance with protocol, no further action was required.

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

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

Nicole Roth
Nicole Roth
CLP Program Manager

Widayati
Wida Ang
Organics Supervisor

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M57

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207008-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20708R15

Level: (low/med) LOW Date Received: 07/06/92

% Moisture: not dec. 10 Date Analyzed: 07/08/92

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	24	B
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	8	J
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

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000006

EPA SAMPLE NO.

B06M57

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207008-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20708R15

Level: (low/med) LOW Date Received: 07/06/92

% Moisture: not dec. 10 Date Analyzed: 07/08/92

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	8.13	10	J

9213517.0113

000007

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B06M57

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207008-01D

Sample wt/vol: 31.0 (g/mL) G Lab File ID: 20724N09

Level: (low/med) LOW Date Received: 07/06/92

% Moisture: 10 decanted: (Y/N) N Date Extracted: 07/09/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/24/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	860	U

9213517.0114

000008

1C

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B06M57

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207008-01D

Sample wt/vol: 31.0 (g/mL) G Lab File ID: 20724N09

Level: (low/med) LOW Date Received: 07/06/92

% Moisture: 10 decanted: (Y/N) N Date Extracted: 07/09/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/24/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-Butylphthalate	620	B
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	110	BJ
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)Anthracene	360	U
117-81-7	bis(2-Ethylhexyl)Phthalate	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

B06M57

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207008-01D

Sample wt/vol: 31.0 (g/mL) G Lab File ID: 20724N09

Level: (low/med) LOW Date Received: 07/06/92

% Moisture: 10 decanted: (Y/N) N Date Extracted: 07/09/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/24/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 14

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Hydrocarbon	4.22	250	J
2.	Unknown Hydrocarbon	4.68	2200	BJ
3.	Unknown Hydrocarbon	4.93	3400	BJ
4.	Unknown Hydrocarbon	5.57	140	BJ
5.	Unknown Hydrocarbon	6.20	4100	J
6.	Unknown Hydrocarbon	6.83	37000	BJ
7.	Unknown Hydrocarbon	7.50	110	J
8.	Unknown Hydrocarbon	8.10	1500	BJ
9.	Unknown Cyclic Ketone	8.48	72	J
10.	Unknown Alkene Ketone	8.60	180	BJ
11.	Subst. Butanol	9.43	320	BJ
12.	Subst. Butanol	9.80	220	BJ
13.	Unknown Carboxylic Acid Este	21.30	500	BJ
14.	Unknown Hydrocarbon	22.83	72	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M57

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207008-01D

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

% Moisture: 10 decanted: (Y/N) N Date Received: 07/06/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 07/09/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/22/92

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.9	U
319-85-7	beta-BHC	1.9	U
319-86-8	delta-BHC	1.9	U
58-89-9	gamma-BHC (Lindane)	1.9	U
76-44-8	Heptachlor	1.9	U
309-00-2	Aldrin	1.9	U
1024-57-3	Heptachlor epoxide	1.9	U
959-98-8	Endosulfan I	1.9	U
60-57-1	Dieldrin	3.6	U
72-55-9	4,4'-DDE	3.6	U
72-20-8	Endrin	3.6	U
33213-65-9	Endosulfan II	3.6	U
72-54-8	4,4'-DDD	3.6	U
1031-07-8	Endosulfan sulfate	3.6	U
50-29-3	4,4'-DDT	3.6	U
72-43-5	Methoxychlor	19	U
53494-70-5	Endrin ketone	3.6	U
7421-36-3	Endrin aldehyde	3.6	U
5103-71-9	alpha-Chlordane	1.9	U
5103-74-2	gamma-Chlordane	1.9	U
8001-35-2	Toxaphene	190	U
12674-11-2	Aroclor-1016	36	U
11104-28-2	Aroclor-1221	73	U
11141-16-5	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12672-29-6	Aroclor-1248	36	U
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

9713517.0117

 Skinner&Sherman REPORT Work Order # S2-07-032

Received: 07/07/92 07/31/92 15:46:01

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

ATTEN Dan Steurmer

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

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

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N2-07-020
TAKEN By Client
TRANS Fedex #2521035112
TYPE 1 Soil (NO3NO2)
P.O. # N2-07-020
INVOICE under separate cover

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 B06M57	NO3NO2 Nitrate Plus Nitrite
01 B06M57D	
01 B06M57S	
02 LCSS	

APR 1996
RECEIVED
Data
Log In

TMA
Thermo Analytical Inc.

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

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

9713517.0118

 Skinner&Sherman REPORT Work Order # S2-07-032

Received: 07/07/92 Results by Sample

SAMPLE ID B06M57 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 06/29/92 Category SOIL

NO3NO2 <2.25
mg N/kg

SAMPLE ID B06M57D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 06/29/92 Category SOIL

NO3NO2 2.71
mg N/kg

SAMPLE ID B06M57S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 06/29/92 Category SOIL

NO3NO2 19.5
mg N/kg

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

NO3NO2 1.79
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 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. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

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

9713517.0119

Received: 07/07/92 07/31/92 15:46:01

TMA/NORCAL

QUALITY CONTROL

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S207032-01	<2.25 mg/kg	19.7 mg/kg	19.5 mg/kg	99.0

DUPLICATE

Sample ID	Sample result	Duplicate Result	Relative % Difference
S207032-01	<2.25 mg/kg	<2.71 mg/kg	not calculable

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	1.79 mg/L	89.5
Prep Blank		<0.25 mg/L	

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

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

Received: 07/07/92

Test Methodology

TEST CODE NO3NO2 NAME Nitrate Plus Nitrite

Methods for Chemical Analysis of Water and Wastes
EPA - 600/4-79-020 March 1979 Method 353.2 (modified)

TMA
Thermo Analytical Inc.

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

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

9713517.0121

TMA
Thermo Analytical Inc.

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

APR 1996
RECEIVED
Data
Log In

August 6, 1992

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 July 07, 1992 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP Target Analyte List metals and cyanide. The analysis were performed under Skinner and Sherman work order S207031.

Methodology

The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion

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

The antimony and selenium digestion spike recovery exceeded the control limit requirements.

The selenium laboratory duplicates 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.

David N. Peterson
Assistant Laboratory Manager

9713517.0122

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-020 SAS No.: SDG No.: B06M57

SOW No.: 7/88

SAMPLE NUMBER:	Lab Sample ID.
B06M57	07031-01S
B06M57D	07031-01S2
B06M57S	07031-01DS

Were ICP interelement corrections applied? Yes/No YES
Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

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

Signature: Name: David N. Peterson

Date: 8/06/92 Title: Asst. Laboratory Manager

9713517.0123

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B06M57

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-020SAS No.: SDG No.: B06M57

Matrix (soil/water): SOIL Lab Sample ID: 07031-01S

Level (low/med): LOW Date Received: 07/07/92

% Solids: 87.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5500.00			P
7440-36-0	Antimony	3.50	U	N	P
7440-38-2	Arsenic	1.70	B		F
7440-39-3	Barium	45.70			P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	6820.00			P
7440-47-3	Chromium	9.50			P
7440-48-4	Cobalt	6.80	B		P
7440-50-8	Copper	16.20			P
7439-89-6	Iron	12800.00			P
7439-92-1	Lead	2.70			F
7439-95-4	Magnesium	3690.00			P
7439-96-5	Manganese	207.00			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.40			P
7440-09-7	Potassium	773.00	B		P
7782-49-2	Selenium	1.40		SN*	F
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	258.00	B		P
7440-28-0	Thallium	0.20	U		F
7440-62-2	Vanadium	29.10			P
7440-66-6	Zinc	42.10			P
	Cyanide	0.57	U		CA

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
ROCKS

002

WESTINGHOUSE/HANFORD

6
DUPLICATES

SAMPLE NUMBER:

B06M57D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-020SAS No.: SDG No.: B06M57

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

% Solids for Sample: 87.2 % Solids for Duplicate: 88.3

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		5503.1006		5404.7619		1.8		P
Antimony		3.4616	U	3.5605	U			P
Arsenic		1.7148	B	1.4825	B	14.5		F
Barium	42.5	45.7187		38.3049	B	17.6		P
Beryllium		0.1487	U	0.1529	U			P
Cadmium		0.3186	U	0.3277	U			P
Calcium		6818.0853		6894.9323		1.1		P
Chromium	2.1	9.5375		8.4993		11.5		P
Cobalt		6.7915	B	6.2429	B	8.4		P
Copper	5.3	16.1973		14.3644		12.0		P
Iron		12840.2141		11602.6649		10.1		P
Lead	0.7	2.6696		2.9251		9.1		F
Magnesium	1061.8	3692.0234		3582.7872		3.0		P
Manganese		207.1441		211.2691		2.0		P
Mercury		0.0521	U	0.0573	U			CV
Nickel	8.5	10.3912		9.5478		8.5		P
Potassium		773.0632	B	691.0660	B	11.2		P
Selenium	1.1	1.3583		0.8320	U	200.0	*	F
Silver		1.0194	U	1.0485	U			P
Sodium		258.3461	B	247.1385	B	4.4		P
Thallium		0.2004	U	0.2024	U			F
Vanadium	10.6	29.1008		24.6789		16.4		P
Zinc		42.1466		41.2014		2.3		P
Cyanide		0.5734	U	0.5677	U			CA

9213917.0125

TMA
Thermo Analytical Inc.

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

September 8, 1992 SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N2-06-166-7053

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on the Summary Data Section, are the gross alpha, gross beta, ^{14}C, ^{90}Sr, isotopic uranium, isotopic plutonium, ^{241}Am, and gamma scan results for the soil samples from 100-KR-4 Location, we received 29 June 1992. The QA/QC results are also given in the Summary Data Section.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

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

DPK/ss

Enclosures: Section 1 through 12
Appendices

9213517.0126

N206166-07

TMA NORCAL

REPORTING GROUP 7053

REPLICATE

B06M50

SDG 7053
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

REPLICATE
Lab sample id N206166-07
Dept sample id 7053-007

ORIGINAL
Lab sample id N206166-01
Dept sample id 7053-001
Received 06/29/92

Client sample id B06M50
Matrix SOIL
Collected 06/25/92
Chain of custody id EFL 1021

PARAMETER	REPLICATE 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	5.5	5.7	7.7	10	U	80A	-0.77	3.4	5.8	U	-		
Gross Beta	14	4.1	5.4	15	J	80B	13	3.9	5.2	J	7	76	35
Uranium 233/234	0.67	0.41	0.46	0.30		U	0.44	0.23	0.21		41	130	35
Uranium 235	0.058	0.12	0.44	0.30	U	U	0	0.053	0.20	U	-		
Uranium 238	0.58	0.31	0.37	0.30		U	0.59	0.24	0.17		2	101	35
Plutonium 239/240	0	0.009	0.025	0.050	U	PU	0.017	0.017	0.032	U	-		
Americium 241	-0.005	0.006	0.015	0.050	U	AM	-0.007	0.026	0.055	U	-		
Strontium 90	-0.14	0.71	0.62	2.0	U	Y	0	2.2	0.81	U	-		
Carbon 14	6.9	9.9	16	50	U	C	4.1	12	19	U	-		
GAMMA SCAN ANALYTES													
Potassium 40	10	1.6				GAM	11	1.7			10	47	35
Iron 59	U		0.65		U	GAM					0	215	35
Chromium 51	U		2.2		U	GAM	U		2.0	U	-		
Cobalt 60	U		0.11		U	GAM	U		0.11	U	-		
Zinc 65	U		0.23		U	GAM	U		0.29	U	-		
Ruthenium 106	U		0.87		U	GAM	U		0.83	U	-		
Cesium 134	U		0.11		U	GAM	U		0.14	U	-		
Cesium 137	U		0.10		U	GAM	U		0.10	U	-		
Europium 152	U		0.16		U	GAM	U		0.17	U	-		
Europium 154	U		0.10		U	GAM	U		0.11	U	-		
Radium 226	0.44	0.15				GAM	0.49	0.19			11	85	35
Thorium 228	0.54	0.16				GAM	0.53	0.19			2	77	35
Thorium 232	U		0.58		U	GAM	0.63	0.46			8	187	35

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-REP
Version 2.15
Report date 09/08/92

9213517.0127

N206166-03

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

B06M33

SDG 7053
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-03
Dept sample id 7053-003
Received 07/09/92

Client sample id B06M33
Matrix SOIL
Collected 07/07/92
Chain of custody id EFL 1022

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	5.9	4.1	4.7	10	J	80A
Gross Beta	Beta	13	4.5	6.3	15	J	80B
Uranium 233/234		0.37	0.17	0.12	0.30		U
Uranium 235	15117-96-1	0.019	0.039	0.15	0.30	U	U
Uranium 238	7440-61-1	0.29	0.13	0.12	0.30	J	U
Plutonium 239/240		0	0.005	0.019	0.050	U	PU
Americium 241	14596-10-2	-0.007	0.009	0.021	0.050	U	AM
Strontium 90	10098-97-2	-0.17	0.83	0.85	2.0	U	Y
Carbon 14	14762-75-5	-0.97	7.4	12	50	U	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	1.6				GAM
Iron 59		U		0.53		U	GAM
Chromium 51	14392-02-0	U		1.4		U	GAM
Cobalt 60	10198-40-0	U		0.086		U	GAM
Zinc 65	17982-39-3	U		0.19		U	GAM
Ruthenium 106	13967-48-1	U		0.74		U	GAM
Cesium 134	17967-70-9	U		0.10		U	GAM
Cesium 137	10045-97-3	U		0.082		U	GAM
Europium 152	14683-23-9	U		0.15		U	GAM
Europium 154	15585-10-1	U		0.098		U	GAM
Radium 226	13982-67-7	0.40	0.16				GAM
Thorium 228	14274-82-9	0.65	0.11				GAM
Thorium 232	7440-29-1	0.50	0.34				GAM

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

9716517.0128

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-04

B06M34

SDG	7053	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N206166-04	Client sample id	B06M34
Dept sample id	7053-004	Matrix	SOIL
Received	07/09/92	Collected	07/07/92
		Chain of custody id	EFL 1022

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	2.9	4.1	5.7	10	U	80A
Gross Beta	Beta	13	4.1	5.5	15	J	80B
Uranium 233/234		0.27	0.15	0.18	0.30	J	U
Uranium 235	15117-96-1	0.029	0.059	0.22	0.30	U	U
Uranium 238	7440-61-1	0.24	0.15	0.18	0.30	J	U
Plutonium 239/240		0.15	0.043	0.028	0.050		PU
Americium 241	14596-10-2	0.23	0.062	0.050	0.050		AM
Strontium 90	10098-97-2	0.15	0.25	0.94	2.0	U	Y
Carbon 14	14762-75-5	5.3	8.1	13	50	U	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	9.2	0.71				GAM
Iron 59		U		0.17		U	GAM
Chromium 51	14392-02-0	U		0.54		U	GAM
Cobalt 60	10198-40-0	U		0.032		U	GAM
Zinc 65	17982-39-3	U		0.094		U	GAM
Ruthenium 106	13967-48-1	U		0.27		U	GAM
Cesium 134	17967-70-9	U		0.057		U	GAM
Cesium 137	10045-97-3	U		0.037		U	GAM
Europium 152	14683-23-9	U		0.078		U	GAM
Europium 154	15585-10-1	U		0.050		U	GAM
Radium 226	13982-67-7	0.39	0.073				GAM
Thorium 228	14274-82-9	0.74	0.073				GAM
Thorium 232	7440-29-1	0.55	0.15				GAM

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.15
Report date	09/08/92

9213517.0129

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-01

B06M50

SDG 7053
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-01
Dept sample id 7053-001
Received 06/29/92

Client sample id B06M50
Matrix SOIL
Collected 06/25/92
Chain of custody id EFL 1021

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	-0.77	3.4	5.8	10	U	80A
Gross Beta	Beta	13	3.9	5.2	15	J	80B
Uranium 233/234		0.44	0.23	0.21	0.30		U
Uranium 235	15117-96-1	0	0.053	0.20	0.30	U	U
Uranium 238	7440-61-1	0.59	0.24	0.17	0.30		U
Plutonium 239/240		0.017	0.017	0.032	0.050	U	PU
Americium 241	14596-10-2	-0.007	0.026	0.055	0.050	U	AM
Strontium 90	10098-97-2	0	2.2	0.81	2.0	U	Y
Carbon 14	14762-75-5	4.1	12	19	50	U	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	1.7				GAM
Chromium 51	14392-02-0	U		2.0		U	GAM
Cobalt 60	10198-40-0	U		0.11		U	GAM
Zinc 65	17982-39-3	U		0.29		U	GAM
Ruthenium 106	13967-48-1	U		0.83		U	GAM
Cesium 134	17967-70-9	U		0.14		U	GAM
Cesium 137	10045-97-3	U		0.10		U	GAM
Europium 152	14683-23-9	U		0.17		U	GAM
Europium 154	15585-10-1	U		0.11		U	GAM
Radium 226	13982-67-7	0.49	0.19				GAM
Thorium 228	14274-82-9	0.53	0.19				GAM
Thorium 232	7440-29-1	0.63	0.46				GAM

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

9213517.0150

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-02

B06M57

SDG 7053
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-02
Dept sample id 7053-002
Received 07/06/92

Client sample id B06M57
Matrix SOIL
Collected 06/29/92
Chain of custody id EFL 1021

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	4.9	4.6	5.8	10	U	80A
Gross Beta	Beta	12	4.3	6.1	15	J	80B
Uranium 233/234		0.53	0.24	0.18	0.30		U
Uranium 235	15117-96-1	0	0.056	0.21	0.30	U	U
Uranium 238	7440-61-1	0.48	0.24	0.18	0.30		U
Plutonium 239/240		-0.002	0.008	0.019	0.050	U	PU
Americium 241	14596-10-2	-0.002	0.007	0.017	0.050	U	AM
Strontium 90	10098-97-2	0.23	0.26	0.96	2.0	U	Y
Carbon 14	14762-75-5	24	11	17	50	J	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	0.81				GAM
Iron 59		U		0.24		U	GAM
Chromium 51	14392-02-0	U		0.72		U	GAM
Cobalt 60	10198-40-0	U		0.041		U	GAM
Zinc 65	17982-39-3	U		0.10		U	GAM
Ruthenium 106	13967-48-1	U		0.35		U	GAM
Cesium 134	17967-70-9	U		0.043		U	GAM
Cesium 137	10045-97-3	U		0.038		U	GAM
Europium 152	14683-23-9	U		0.084		U	GAM
Europium 154	15585-10-1	U		0.056		U	GAM
Radium 226	13982-67-7	0.48	0.074				GAM
Thorium 228	14274-82-9	0.62	0.049				GAM
Thorium 232	7440-29-1	0.50	0.16				GAM

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

9713517.0131

VALIDATION SUMMARY

DATA QUALIFICATION SUMMARY

UNIT: 100-KR-4

DOCUMENT CONTROL NUMBER: WHC-SD-EN-TI-134

ANALYSES: VOC, BNA, Pest/PCB, Inorganics, Wet Chemistry

RFW NO.: B06M50-TMA-221

SDG NO.: B06M50

QUALIFICATION SUMMARY:

VOLATILES

SAMPLE NUMBERS: B06M50

BLANKS

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for acetone:

- Sample number B06M50 in SDG No. B06M50.

SEMIVOLATILES

SAMPLE NUMBERS: B06M50

HOLDING TIMES

The seven-day holding time was exceeded for sample number B06M50 in SDG No. B06M50. All associated sample results were qualified as estimates and flagged "J".

BLANKS

Due to the presence of di-n-butylphthalate in the laboratory blank, the following samples were flagged "U":

- Sample number B06M50 in SDG No. B06M50.

PESTICIDES/PCBS

SAMPLE NUMBERS: B06M50

HOLDING TIMES

The seven-day holding time was exceeded for sample number B06M50 in SDG No. B06M50. All associated results were qualified as estimates and flagged "J".

INITIAL CALIBRATIONS

Due to initial calibration RSDs above the QC limit, the following were qualified as estimates and flagged "J":

- Alpha-BHC, delta-BHC, 4,4'-DDE, 4,4'-DDD, aldrin, and dieldrin in sample number B06M50 in SDG No. B06M50.

INORGANICS

SAMPLE NUMBERS: B06M50

BLANKS

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for arsenic:

- Sample number B06M50 in SDG No. B06M50.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for beryllium:

- Sample number B06M50 in SDG No. B06M50.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for selenium:

- Sample number B06M50 in SDG No. B06M50.

MATRIX SPIKE RECOVERY

The matrix spike recoveries fell outside the QC limits for antimony. All associated results were qualified as estimates and flagged "J" for the following sample:

- Sample number B06M50 in SDG No. B06M50.

LABORATORY DUPLICATE SAMPLES

The laboratory duplicate results fell outside the QC limits for selenium. All associated results were qualified as estimates and flagged "J" for the following sample:

- Sample number B06M50 in SDG No. B06M50.

WET CHEMISTRY

SAMPLE NUMBERS: B06M50

No qualifiers added to data.

9215517.0134

000002

Westinghouse Hanford Company	CHAIN OF CUSTODY	ARL 1

Custody Form Initiator: CM Chance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 6-25-92

Ice Chest No.: SML-77

Field Logbook No.: EFL-1021

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M5D
~~1,120ml G:CLP;ICP/AA Metals,Hg~~
~~1,120ml G:CLP;Cn~~
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
~~1,1000ml aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241~~
950

2)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 6-25-92

3)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

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

Relinquished by:	Received by:	Date/Time:
CM Chance Cory Chance	Kermit Blum	6-29-92 0800 *
Kermit Blum 6-29-92	[signature]	6-30-92 10:00

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received @ TMA/Norcal 6-27-92 @ 1300; opened 6-29-92. KB

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

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector CM Chance
Company Contact CM CHANCE

Date ~~6-26-92~~ 6-25-92 6-25-92
Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M50	S	6-25-92	1350	~~1-120ml G CLP;ICP/AA Metals,Hg~~ ~~1-120ml G CLP;CN~~ 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) ~~1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14~~ 6-25-92 950 ~~U-235/238,Pu-239/240,Am-241~~
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
		C(6-25-92		

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

9213517.0136

000005

EPA SAMPLE NO.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20701R03

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: not dec. 8 Date Analyzed: 07/01/92

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	24	~~B~~ 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	2	J
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

2-9-9

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20701R03

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: not dec. 8 Date Analyzed: 07/01/92

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	8.25	7	J

2-9-93
MY

9213517.0138

000007

EPA SAMPLE NO.

B06M50

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 20723N07

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: 8 decanted: (Y/N) N Date Extracted: 07/08/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/23/92

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

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

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

2-9-93

9216517.0139

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 000008

B06M50

ab Name: TMA/ARLI Contract: WHC

ab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

atrix: (soil/water) SOIL Lab Sample ID: A206084-01D

ample wt/vol: 30.4 (g/mL) G Lab File ID: 20723N07

evel: (low/med) LOW Date Received: 06/29/92

Moisture: 8 decanted: (Y/N) N Date Extracted: 07/08/92

oncentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/23/92

njection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	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 ~~64~~	~~BJ~~ UJ
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

2-9-93

9216517.0140

000009

EPA SAMPLE NO.

B06M50

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 20723N07

Level: (low/med) LOW Date Received: 06/29/92

% Moisture: 8 decanted: (Y/N) N Date Extracted: 07/08/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/23/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 18

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	4.22	320	~~BJ~~ U
2.	Unknown alkene	4.95	140	~~BJ~~ U
3.	Unknown hydrocarbon	5.62	250	~~BJ~~ U
4.	Unknown alkene	5.80	110	~~BJ~~ U
5.	Unknown alkene	5.87	110	J
6.	Unknown hydrocarbon	6.20	2800	J
7.	Unknown hydrocarbon	6.32	2500	J
8.	Unknown alcohol	6.38	1200	J
9.	Unknown hydrocarbon	6.98	56000	~~BJ~~ U
10.	Unknown alkene	7.10	320	~~BJ~~ U
11.	Unknown alkane	7.25	140	J
12.	Unknown hydrocarbon	7.58	210	~~BJ~~ U
13.	Unknown hydrocarbon	8.18	2400	~~BJ~~ U
14.	Unknown hydrocarbon	8.45	540	J
15.	Unknown ketone	8.57	110	~~BJ~~ U
16.	Unknown ketone	8.68	320	~~BJ~~ U
17.	Unknown alcohol	9.53	570	~~BJ~~ U
18.	Unknown ketone	14.68	72	J

2-9-9 MM

9713517.0141

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M50

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A206084-01D

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

% Moisture: 8 decanted: (Y/N) N Date Received: 06/29/92

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 07/06/92

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/22/92

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.8	UJ
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	UJ

RB 5/6/93

9213517.0142

B06M5D

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B06M5D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-06-164SAS No.: SDG No.: B06M5D

Matrix (soil/water): SOIL Lab Sample ID: 07009-01S

Level (low/med): LOW Date Received: 06/30/92

% Solids: 90.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6200.00			P
7440-36-0	Antimony	3.30	U	~~N~~ J	P
7440-38-2	Arsenic	1.10	~~B~~	U	F
7440-39-3	Barium	63.10			P
7440-41-7	Beryllium	0.31	B	U	P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	6130.00			P
7440-47-3	Chromium	8.60			P
7440-48-4	Cobalt	7.20	B		P
7440-50-8	Copper	17.80			P
7439-89-6	Iron	12400.00			P
7439-92-1	Lead	3.10			F
7439-95-4	Magnesium	3280.00			P
7439-96-5	Manganese	212.00			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	8.50			P
7440-09-7	Potassium	1000.00	B		P
7782-49-2	Selenium	1.80		~~N~~ J	F
7440-22-4	Silver	0.97	U		P
7440-23-5	Sodium	320.00	B		P
7440-28-0	Thallium	0.33	U		F
7440-62-2	Vanadium	31.60			P
7440-66-6	Zinc	36.50			P
	Cyanide	0.53	U		CA

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: GREY Clarity After: Artifacts: YES

Comments:
STONES

2-19-93SC

002

FORM I - IN

6/22/93

Rev.6/89

9713517.0143

000010

TMA Inc. REPORT Work Order # A2-06-084

Received: 06/29/92

Results by Sample

SAMPLE ID B06M50 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 06/25/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	1.8	mg/Kg	1.0
Sulfate	300	37	mg/Kg	10

FORM I

2-19-93 SC

PJD
6/22/93

Page 2 Skinner&Sherman REPORT Work Order # S2-07-018

Received: 06/30/92 Results by Sample

SAMPLE ID B06M5D O SAMPLE # 01 FRACTIONS: A

Date & Time Collected 06/25/92 Category SOIL

NO3NO2 2.56 mg N/kg

method # 353.2

SAMPLE ID B06M5D D SAMPLE # 01 FRACTIONS: B

Date & Time Collected 06/25/92 Category SOIL

NO3NO2 2.62 mg N/kg

SAMPLE ID B06M5D S SAMPLE # 01 FRACTIONS: C

Date & Time Collected 06/25/92 Category SOIL

NO3NO2 19.3 mg N/kg

SAMPLE ID LCSS SAMPLE # 02 FRACTIONS: A

Date & Time Collected not specified Category SOIL

NO3NO2 1.92 mg N/L

2-19-93 SC

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is sa
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.
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
amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, I
exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are
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) 890-720
1-800-4 LAB TEST FAX (617) 890-3883

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: Westinghouse Data Validation	REVIEWER: MM	DATE: 2-9-93
LABORATORY: JMA	CASE: 06-084	SDG:
SAMPLES/MATRIX: Soil ; B06M50		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC			✓

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC			✓
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? Yes No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a BFB tune report present for each applicable 12h period? Yes No N/A

Do all tunes on all instruments meet the tuning criteria? Yes No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No N/A

Has the laboratory made any calculation or transciption errors? Yes No N/A

Have the proper significant figures been reported? Yes No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for non-detects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? Yes No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes No N/A

Are all RRF values ≥0.05 (2/88 SOW)? Yes No N/A

Are all applicable RSD values ≤~~20.5%~~ 25.0% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed ?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is < CRQL. Qualify all remaining sample results <5X the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries less than 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for non-detects) for surrogates out of specification but greater than 10%. Qualify all associated positive sample results as estimated (J) and all non-detect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and not the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are greater than five times the CRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for non-detects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard? Yes No N/A

Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra? Yes No N/A

Do the relative intensities between the standard and sample spectra agree within 20%? Yes No N/A

Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination? Yes No N/A

Are molecular ions present in the reference specrum present in the sample spectrum? Yes No N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation? Yes No N/A

Are results and quantitation limits calculated properly? Yes No N/A

Has the laboratory reported the sample quantitation limits within five times the CRQL values? Yes No N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW? Yes No N/A

Has the laboratory properly identified and coded all TIC? Yes No N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as non-detects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as non-detects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

SEMI-VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-2

PROJECT: Westinghouse Data Validation	REVIEWER: MY	DATE: 2-9-93
LABORATORY: IMA	CASE: 06-084	SDG: B06M50
SAMPLES/MATRIX: Soil; B06M50		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		

Data Package Item	Present?: Yes	No	N/A
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Were all samples extracted within holding time?	Yes	No	N/A
Were all samples analyzed within holding time?	Yes	No	N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a DFTPP tune report present for each applicable 12h period?	Yes	No	N/A
Do all tunes on all instruments meet the tuning criteria?	Yes	No	N/A
Do all tunes on all instruments meet the expanded criteria?	Yes	No	N/A
Has the laboratory made any calculation or transciption errors?	Yes	No	N/A
Have the proper significant figures been reported?	Yes	No	N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects and UJ for non-detects). If all tuning criteria are not met, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments?	Yes	No	N/A
Are all RSD values ≤30% (2/88 SOW)?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤~~20.5%~~ 25.0% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A

Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3 CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every extraction batch?	Yes	No	N/A
Are compounds reported in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is < CRQL. Qualify all remaining sample results < 5X the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are compounds reported in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the results of the field blanks in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries less than 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated data as estimated (J for detects and UJ for non-detects) if at least two semivolatile surrogates are out of specification. If any surrogate is below 10% recovery qualify associated detected results as estimated (J) and associated non-detect results as unusable (R). If method blank surrogates are out of specification and associated sample surrogates are acceptable no qualification is required, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the results for the performance audit samples within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are all RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and not the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are greater than five times the CRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects and UJ for non-detects. If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

No Defects

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R).

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standards for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within five times the CRQL values?	Yes	No	N/A

ACTION: If the quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as non-detects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as non-detects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: Westinghouse Data Validation	REVIEWER: MY	DATE: 2-10-93
LABORATORY: TMA	CASE: 06084	SDG: B06M50
SAMPLES/MATRIX: Soil ; B06M50		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for re-submittal.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		✓		
Data Summary		✓		
Chain-of-Custody		✓		
QC Summary				
Surrogate report		✓		
MS/MSD report		✓		
Blank summary report		✓		
Sample Data				
Sample reports		✓		
Chromatograms		✓		
GC integration reports		✓		
Worksheets			✓	
UV traces from GPC		✓		
GC/MS confirmation spectra				✓
Standards Data				
Pesticides Evaluation Standards Summary		✓		
Pesticides/PCB Standards Summary		✓		
Pesticides/PCB identification		✓		
Pesticides standard chromatograms		✓		
Raw QC Data				
Blank analysis report forms and chromatograms		✓		
MS/MSD report forms and chromatograms		✓		

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Were all samples extracted within holding time? Yes **(No)** N/A

Were all samples analyzed within holding time? **(Yes)** No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? Yes No **(N/A)**

ACTION: If DDT retention time is < 12 minutes and resolution is ≤25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? Yes No **(N/A)**

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? Yes No **(N/A)**

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns < 20%? Yes No **(N/A)**

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all non-detects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns < 20%? Yes No **(N/A)**

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all non-detects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification? Yes No N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%? Yes No N/A

Have all standards been analyzed within 72 hours of any sample? Yes No N/A

Has a 3-point calibration been conducted for DDT or toxaphene? Yes No N/A

Have all standards been analyzed at the start of each 72h sequence? Yes No N/A

Have evaluation standards A, B, and C been analyzed within 72h of any sample? Yes No N/A

Has the confirmation standard mix been analyzed after every 5 samples? Yes No N/A

Has evaluation standard B analyzed every 10 samples? Yes No N/A

Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards? Yes No N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors < 10.0% (< 15.0% for the BHC series, DDT, endrin and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a non-compliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the non-compliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and non-detect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results as non-detects (U) that are <5X the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks? Yes No N/A

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5X the highest valid field blank concentrations as non-detects (U) and note the results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show non-detects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for non-detects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated non-detects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are greater than five times the CRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

No Detects

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations > 10 ppm? Yes No N/A

ACTION: If positive results do not meet the retention time criteria qualify all detected results as non-detects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and non-detected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within five times the CRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

9713517.0170

000010

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B06M50

Name: TMA/ARLI Contract: WHC

Code: TMALA Case No.: 06084 SAS No.: NA SDG No.: NA

rix: (soil/water) SOIL Lab Sample ID: A206084-01D

ple wt/vol: 30.5 (g/mL) G Lab File ID:

oisture: 8 decanted: (Y/N) N Date Received: 06/29/92

raction: (SepF/Cont/Sonc) SONC Date Extracted: 07/06/92

centrated Extract Volume: 5000 (uL) Date Analyzed: 07/22/92

ection Volume: 1.00 (uL) Dilution Factor: 1.00

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

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

2-10-93

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse	REVIEWER: SC	DATE: 2/19/93
LABORATORY: TMA	CASE:	SDG: B06M50
SAMPLES/MATRIX: Water		
B06M30		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative	✓			
Cover Page		✓		
Traffic Reports		✓		
Sample Data				
Inorganic Analysis Data Sheets		✓		
Standards Data				
Initial and Continuing Calibration Verification	✓			
CRDL Standard for AA and ICP		✓		
QC Summary				
Blanks	✓			
ICP Interference Check Summary		✓		
Spike Sample Recovery		✓		
Post-Digestion Spike Sample Recovery				✓
Duplicate		✓		
Laboratory Control Sample		✓		
Standard Addition Results		✓		
ICP Serial Dilutions		✓		
Instrument Detection Limits		✓		
ICP Interelement Correction Factors	✓			
ICP Linear Ranges		✓		
Preparation Log		✓		
Analysis Run Log		✓		
Raw Data				
ICP Raw Data	✓			
Furnace AA Raw Data	✓			
Mercury Raw Data		✓		
Cyanide Raw Data		✓		
Additional Data				
Internal laboratory chain-of-custody	✓	✓		
Laboratory Sample Preparation Records		✓		

Data Package Item	Present?:	Yes	No	N/A
Percent Solids Analysis Records		✓		✓
Reduction Formulae		✓	✓	
Instrument Run Logs	✓			
Chemist Notebook Pages		✓		

2. HOLDING TIMES

Have all samples been analyzed within holding times? Yes No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for non-detects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Yes No N/A

Was a midrange CN standard distilled? Yes No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results > IDL as estimated (J) and results < IDL as estimated (UJ), if the correlation coefficient is < 0.995 or the laboratory did not distill the midrange CN standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? Yes No N/A

Are the AB solution %R values within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (U). If analyte concentrations in the blank are greater than the CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations less than 10x the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5X the amount in any valid field blank as non-detected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all non-detects as estimated (UJ). If spike recovery is <30%, reject all non-detects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients $\geq$0.995?		Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for non-detects). If the analytical spike recovery is less than 40 percent qualify detects as estimated (J). If the analytical spike recovery is greater than or equal to 10% but less than 40 percent, qualify all non-detects as estimated (UJ) and if the analytical spike recovery is less than 10 percent, reject all non-detects (R). If the sample absorbance is less than 50% of the analytical spike absorbance and the analytical spike recovery is less than 85% or greater than 115%, qualify all results as estimated (J for detects and UJ for non-detects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was less than 0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: Westinghouse	REVIEWER: SC	DATE: 2-19-93
LABORATORY: TMA	CASE:	SDG: B06M50
SAMPLES/MATRIX: water		
B06M50		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative	✓			
Cover Page		✓		
Traffic Reports/Chain-of-Custody		✓		
Sample Analysis Data Report Forms	✓			
Standards Data	✓			
QC Summary				
Blanks Summary Report Forms		✓		
Spike Sample Recovery Report Forms	✓			
Duplicate Sample Analysis Report Forms		✓		
Laboratory Control Sample Report Forms		✓		
Raw Data				
Ion Chromatograph Chromatograms	✓			
TOC and TOX Instrument Printouts			✓	
Laboratory Bench Sheets		✓		
Additional Data				
Laboratory Sample Preparation Logs	✓			
Instrument Run Logs	✓			
Internal Laboratory Chain-of-Custory	✓			
Percent Solids Analysis Records			✓	✓
Reduction Formulae			✓	
Chemist Notebook Pages		✓		

2. HOLDING TIMES

Were all samples analyzed within holding times? (Yes) No N/A

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for non-detects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Yes No N/A

Was a balance check conducted prior to the TDS analysis? Yes No N/A

Was the titrant normality checked? Yes No N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency? Yes No N/A

Are ICV and CCV percent recoveries within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5X the amount in any valid field blank as non-detected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits? Yes No N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are greater than the CRQL, qualify the data as estimated (J). If the spike recovery is less than 30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly? Yes No N/A

Are instrument detection limits below the CRDL? Yes No N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

9713517.0182

DATA QUALIFICATION SUMMARY

UNIT: 100-KR-4

DOCUMENT CONTROL NUMBER: WHC-SD-EN-TI-134

ANALYSES: VOC, BNA, Pest/PCB, Inorganics, Wet Chemistry

RFW NO.: B06M57-TMA-222

SDG NO.: B06M57

QUALIFICATION SUMMARY:

VOLATILES

SAMPLE NUMBERS: B06M57

SEMIVOLATILES

SAMPLE NUMBERS: B06M57

PESTICIDES/PCBS

SAMPLE NUMBERS: B06M57

INORGANICS

SAMPLE NUMBERS: B06M57

WET CHEMISTRY

SAMPLE NUMBERS: B06M57

Data from this package were not validated.

Westinghouse Hanford Company

CHAIN OF CUSTODY

ARL

Custody Form Initiator: CM Chance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 6-29-92

Ice Chest No.: SML-113

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M57
~~1,120ml aG:CLP;ICP/AA Metals,Hg~~
~~1,120ml aG:CLP;Cn~~
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
~~1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241~~

2)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

3)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 6-29-92

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

Relinquished by:	Received by:	Date/Time:
CM Chance / Cory Chance	Kermit Blum	7-6-92 0800 *
Relinquished by: 7-6-92 Kermit Blum	Received by: D Whitaker	Date/Time: 7-7-92 10:00
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received 7-2-92 @ 1735 @ TMA/Norcal (after regular work hours). Opened 7-6-92. KB

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

9213517.0184

000003

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector C M Chance Date 6-29-92

Company Contact CM CHANCE Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M57	S	6-29-92	0852	~~1-120ml aG CLP;ICP/AA Metals,Hg~~ ~~1-120ml aG CLP;CN~~ 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) ~~1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241~~
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
	CC	6-29-92		

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

A-6000-406 (06/91) WEF060

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M57

ɔ Name: TMA/ARLI Contract: WHC

ɔ Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

trix: (soil/water) SOIL Lab Sample ID: A207008-01A

mple wt/vol: 5.0 (g/mL) G Lab File ID: 20708R15

vel: (low/med) LOW Date Received: 07/06/92

Moisture: not dec. 10 Date Analyzed: 07/08/92

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

il 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	24	B
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	8	J
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

3-1-93 MM

RB 5/6/93

MM 5/12/93

9213517.0186

000006

EPA SAMPLE NO.

B06M57

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

b Name: TMA/ARLI Contract: WHC

b Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

trix: (soil/water) SOIL Lab Sample ID: A207008-01A

mple wt/vol: 5.0 (g/mL) G Lab File ID: 20708R15

vel: (low/med) LOW Date Received: 07/06/92

Moisture: not dec. 10 Date Analyzed: 07/08/92

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

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

umber TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	8.13	10	J

3-1-93
MM

M
PG
6/22/93

9213517.0187

000007

EPA SAMPLE NO.

B06M57

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

ıb Name: TMA/ARLI Contract: WHC

ıb Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

ıtrix: (soil/water) SOIL Lab Sample ID: A207008-01D

ımple wt/vol: 31.0 (g/mL) G Lab File ID: 20724N09

ɜvel: (low/med) LOW Date Received: 07/06/92

Moisture: 10 decanted: (Y/N) N Date Extracted: 07/09/92

ɔncentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/24/92

ıjection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	860	U

NV 3-2-93

RB 5/6/93

NV

9213517.0188

000008

EPA SAMPLE NO.

B06M57

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

.b Name: TMA/ARLI Contract: WHC

.b Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

.trix: (soil/water) SOIL Lab Sample ID: A207008-01D

.mple wt/vol: 31.0 (g/mL) G Lab File ID: 20724N09

.vel: (low/med) LOW Date Received: 07/06/92

Moisture: 10 decanted: (Y/N) N Date Extracted: 07/09/92

.ncentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/24/92

.jection Volume: 2.0(uL) Dilution Factor: 1.0

.PC Cleanup: (Y/N) Y pH: 9.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	860	U NV
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-Butylphthalate	620	BU
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	~~110~~	BJ
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)Anthracene	360	U
117-81-7	bis(2-Ethylhexyl)Phthalate	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U NV

(1) - Cannot be separated from Diphenylamine

3.2.93 MM

RB 5/6/93

PED 6/22/

9716517.0189

000009

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B06M57

ıb Name: TMA/ARLI Contract: WHC

ıb Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

ıtrix: (soil/water) SOIL Lab Sample ID: A207008-01D

ımple wt/vol: 31.0 (g/mL) G Lab File ID: 20724N09

evel: (low/med) LOW Date Received: 07/06/92

Moisture: 10 decanted: (Y/N) N Date Extracted: 07/09/92

oncentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/24/92

ıjection Volume: 2.0(uL) Dilution Factor: 1.0

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

umber TICs found: 14

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Hydrocarbon	4.22	250	J
2.	Unknown Hydrocarbon	4.68	2200	BJ
3.	Unknown Hydrocarbon	4.93	3400	BJ
4.	Unknown Hydrocarbon	5.57	140	BJ
5.	Unknown Hydrocarbon	6.20	4100	J
6.	Unknown Hydrocarbon	6.83	37000	BJ
7.	Unknown Hydrocarbon	7.50	110	J
8.	Unknown Hydrocarbon	8.10	1500	BJ
9.	Unknown Cyclic Ketone	8.48	72	J
10.	Unknown Alkene Ketone	8.60	180	BJ
11.	Subst. Butanol	9.43	320	BJ
12.	Subst. Butanol	9.80	220	BJ
13.	Unknown Carboxylic Acid Este	21.30	500	BJ
14.	Unknown Hydrocarbon	22.83	72	J

3.29

RB 5/6/93

MM

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M57

Name: TMA/ARLI Contract: WHC

Code: TMALA Case No.: 07008 SAS No.: NA SDG No.: NA

rix: (soil/water) SOIL Lab Sample ID: A207008-01D

ple wt/vol: 30.6 (g/mL) G Lab File ID:

oisture: 10 decanted: (Y/N) N Date Received: 07/06/92

raction: (SepF/Cont/Sonc) SONC Date Extracted: 07/09/92

cen.rated Extract Volume: 5000 (uL) Date Analyzed: 07/22/92

ection Volume: 1.00 (uL) Dilution Factor: 1.00

Cl.anup: (Y/N) Y pH: 9.2 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.9	U
319-85-7	beta-BHC	1.9	U
319-86-8	delta-BHC	1.9	U
58-89-9	gamma-BHC (Lindane)	1.9	U
76-44-8	Heptachlor	1.9	U
309-00-2	Aldrin	1.9	U
1024-57-3	Heptachlor epoxide	1.9	U
959-98-8	Endosulfan I	1.9	U
60-57-1	Dieldrin	3.6	U
72-55-9	4,4'-DDE	3.6	U
72-20-8	Endrin	3.6	U
33213-65-9	Endosulfan II	3.6	U
72-54-8	4,4'-DDD	3.6	U
1031-07-8	Endosulfan sulfate	3.6	U
50-29-3	4,4'-DDT	3.6	U
72-43-5	Methoxychlor	19	U
53494-70-5	Endrin ketone	3.6	U
7421-36-3	Endrin aldehyde	3.6	U
5103-71-9	alpha-Chlordane	1.9	U
5103-74-2	gamma-Chlordane	1.9	U
8001-35-2	Toxaphene	190	U
12674-11-2	Aroclor-1016	36	U
11104-28-2	Aroclor-1221	73	U
11141-16-5	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12672-29-6	Aroclor-1248	36	U
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

3-2-93 MM

5/6/93 RB

MM

9213517.0191

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B06M57

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N2-07-020SAS No.: SDG No.: B06M57

atrix (soil/water): SOIL Lab Sample ID: 07031-01S

evel (low/med): LOW Date Received: 07/07/92

Solids: 87.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5500.00			P
7440-36-0	Antimony	3.50	U	N	P
7440-38-2	Arsenic	1.70	B		F
7440-39-3	Barium	45.70			P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	6820.00			P
7440-47-3	Chromium	9.50			P
7440-48-4	Cobalt	6.80	B		P
7440-50-8	Copper	16.20			P
7439-89-6	Iron	12800.00			P
7439-92-1	Lead	2.70			F
7439-95-4	Magnesium	3690.00			P
7439-96-5	Manganese	207.00			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.40			P
7440-09-7	Potassium	773.00	B		P
7782-49-2	Selenium	1.40		SN*	F
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	258.00	B		P
7440-28-0	Thallium	0.20	U		F
7440-62-2	Vanadium	29.10			P
7440-66-6	Zinc	42.10			P
	Cyanide	0.57	U		CA

MM
PBN
6/22/93

olor Before: BROWN Clarity Before: Texture: MEDIUM

olor After: BROWN Clarity After: Artifacts: YES

omments:
ROCKS

002

TMA Inc. REPORT Work Order # A2-07-008

eceived: 07/06/92 Results by Sample

AMPLE ID B06M57 FRACTION 01G TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 06/29/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	2.2	mg/Kg	1.0
Sulfate	300	40	mg/Kg	10

FORM I

MJ
RBS
6/22/93

Received: 07/07/92 Results by Sample

SAMPLE ID B06M57 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 06/29/92 Category SOIL

NO3NO2 ~~2~~.25 U
mg N/kg

SAMPLE ID B06M57D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 06/29/92 Category SOIL

NO3NO2 2.71
mg N/kg

SAMPLE ID B06M57S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 06/29/92 Category SOIL

NO3NO2 19.5
mg N/kg

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

NO3NO2 1.79
mg N/L

PBD
6/22/93

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. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

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

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: Westinghouse Data Validation	REVIEWER: MY	DATE: 2-26-93
LABORATORY: JMA	CASE: 07-008	SDG: B06M57
SAMPLES/MATRIX: Soil ; B06M57		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC			✓

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC			✓
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a BFB tune report present for each applicable 12h period? (Yes) No N/A

Do all tunes on all instruments meet the tuning criteria? (Yes) No N/A

Do all tunes on all instruments meet the expanded criteria? (Yes) No N/A

Has the laboratory made any calculation or transciption errors? Yes (No) N/A

Have the proper significant figures been reported? (Yes) No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for non-detects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? (Yes) No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes No (N/A)

Are all RRF values ≥0.05 (2/88 SOW)? Yes No (N/A)

Are all applicable RSD values ≤~~20.5~~ 25.0% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed ?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is < CRQL. Qualify all remaining sample results < 5X the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries less than 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for non-detects) for surrogates out of specification but greater than 10%. Qualify all associated positive sample results as estimated (J) and all non-detect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and not the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are greater than five times the CRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for non-detects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard? Yes No N/A

Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra? Yes No N/A

Do the relative intensities between the standard and sample spectra agree within 20%? Yes No N/A

Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination? Yes No N/A

Are molecular ions present in the reference specrum present in the sample spectrum? Yes No N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation? Yes No N/A

Are results and quantitation limits calculated properly? Yes No N/A

Has the laboratory reported the sample quantitation limits within five times the CRQL values? Yes No N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW? Yes No N/A

Has the laboratory properly identified and coded all TIC? Yes No N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as non-detects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as non-detects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

SEMI-VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-2

PROJECT: Westinghouse Data Validation	REVIEWER: MJ	DATE: 3-1-93
LABORATORY: IMA	CASE: 07008	SDG: B06M57
SAMPLES/MATRIX: Soil; B06M57		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		

Data Package Item	Present?: Yes	No	N/A
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Were all samples extracted within holding time?	Yes	No	N/A
Were all samples analyzed within holding time?	Yes	No	N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a DFTPP tune report present for each applicable 12h period?	Yes	No	N/A
Do all tunes on all instruments meet the tuning criteria?	Yes	No	N/A
Do all tunes on all instruments meet the expanded criteria?	Yes	No	N/A
Has the laboratory made any calculation or transciption errors?	Yes	No	N/A
Have the proper significant figures been reported?	Yes	No	N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects and UJ for non-detects). If all tuning criteria are not met, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments?	Yes	No	N/A
Are all RSD values ≤30% (2/88 SOW)?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤~~20.5~~ 25.0% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A

Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3 CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every extraction batch?	Yes	No	N/A
Are compounds reported in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is < CRQL. Qualify all remaining sample results < 5X the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are compounds reported in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the results of the field blanks in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries less than 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated data as estimated (J for detects and UJ for non-detects) if at least two semivolatile surrogates are out of specification. If any surrogate is below 10% recovery qualify associated detected results as estimated (J) and associated non-detect results as unusable (R). If method blank surrogates are out of specification and associated sample surrogates are acceptable no qualification is required, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the results for the performance audit samples within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are all RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and not the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are greater than five times the CRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects and UJ for non-detects. If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R).

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standards for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within five times the CRQL values?	Yes	No	N/A

ACTION: If the quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as non-detects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as non-detects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: Westinghouse Data Validation	REVIEWER: MY	DATE: 3-2-93
LABORATORY: JMA	CASE: 07008	SDG: B06M57
SAMPLES/MATRIX: Soil; B06M57		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for re-submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
Sample Data			
Sample reports	✓		
Chromatograms	✓		
GC integration reports	✓		
Worksheets		✓	
UV traces from GPC	✓		
GC/MS confirmation spectra			✓
Standards Data			
Pesticides Evaluation Standards Summary	✓		
Pesticides/PCB Standards Summary	✓		
Pesticides/PCB identification	✓		
Pesticides standard chromatograms	✓		
Raw QC Data			
Blank analysis report forms and chromatograms	✓		
MS/MSD report forms and chromatograms	✓		

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

	Yes	No	N/A
Were all samples extracted within holding time?		(No)	
Were all samples analyzed within holding time?	(Yes)		

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? Yes No (N/A)

ACTION: If DDT retention time is < 12 minutes and resolution is ≤25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? Yes No (N/A)

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? Yes No (N/A)

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns <20%? Yes No (N/A)

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all non-detects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns <20%? Yes No (N/A)

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all non-detects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification? Yes No N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%? Yes No N/A

Have all standards been analyzed within 72 hours of any sample? Yes No N/A

Has a 3-point calibration been conducted for DDT or toxaphene? Yes No N/A

Have all standards been analyzed at the start of each 72h sequence? Yes No N/A

Have evaluation standards A, B, and C been analyzed within 72h of any sample? Yes No N/A

Has the confirmation standard mix been analyzed after every 5 samples? Yes No N/A

Has evaluation standard B analyzed every 10 samples? Yes No N/A

Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards? Yes No N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors < 10.0% (< 15.0% for the BHC series, DDT, endrin and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a non-compliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the non-compliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and non-detect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results as non-detects (U) that are <5X the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks? Yes No N/A

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5X the highest valid field blank concentrations as non-detects (U) and note the results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show non-detects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for non-detects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated non-detects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are greater than five times the CRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

No Detects

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations > 10 ppm? Yes No N/A

ACTION: If positive results do not meet the retention time criteria qualify all detected results as non-detects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and non-detected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within five times the CRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

SEMI-VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-2

PROJECT: Westinghouse Data Validation	REVIEWER: MJ	DATE: 2-17-93
LABORATORY: TMA	CASE: 07016	SDG: B06M33
SAMPLES/MATRIX: Soils; B06M33, B06M34		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
Standards Data			
Initial calibration report	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC	✓		
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		

Data Package Item	Present?: Yes	No	N/A
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Were all samples extracted within holding time?	Yes	(No)	N/A
Were all samples analyzed within holding time?	(Yes)	No	N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a DFTPP tune report present for each applicable 12h period?	(Yes)	No	N/A
Do all tunes on all instruments meet the tuning criteria?	(Yes)	No	N/A
Do all tunes on all instruments meet the expanded criteria?	(Yes)	No	N/A
Has the laboratory made any calculation or transciption errors?	Yes	(No)	N/A
Have the proper significant figures been reported?	(Yes)	No	N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects and UJ for non-detects). If all tuning criteria are not met, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments?	(Yes)	No	N/A
Are all RSD values ≤30% (2/88 SOW)?	Yes	No	(N/A)
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	(N/A)
Are all applicable RSD values ≤20.5% (3/90 SOW)?	(Yes)	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	(Yes)	No	N/A

Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3 CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every extraction batch?	Yes	No	N/A
Are compounds reported in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results <5X the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are compounds reported in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the results of the field blanks in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries less than 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated data as estimated (J for detects and UJ for non-detects) if at least two semivolatile surrogates are out of specification. If any surrogate is below 10% recovery qualify associated detected results as estimated (J) and associated non-detect results as unusable (R). If method blank surrogates are out of specification and associated sample surrogates are acceptable no qualification is required, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the results for the performance audit samples within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are all RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and not the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are greater than five times the CRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects and UJ for non-detects. If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R).

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standards for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within five times the CRQL values?	Yes	No	N/A

ACTION: If the quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as non-detects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as non-detects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: Westinghouse Data Validation	REVIEWER: MJ	DATE: 2/17/93
LABORATORY: TMA	CASE: 07016	SDG: B06M33
SAMPLES/MATRIX: Soils ; B06M33, B06M34		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for re-submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
Sample Data			
Sample reports	✓		
Chromatograms	✓		
GC integration reports	✓		
Worksheets		✓	
UV traces from GPC	✓		
GC/MS confirmation spectra			✓
Standards Data			
Pesticides Evaluation Standards Summary	✓		
Pesticides/PCB Standards Summary	✓		
Pesticides/PCB identification	✓		
Pesticides standard chromatograms	✓		
Raw QC Data			
Blank analysis report forms and chromatograms	✓		
MS/MSD report forms and chromatograms	✓		

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Were all samples extracted within holding time? Yes **(No)** N/A

Were all samples analyzed within holding time? **(Yes)** No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? Yes No **(N/A)**

ACTION: If DDT retention time is < 12 minutes and resolution is ≤25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? Yes No **(N/A)**

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? Yes No **(N/A)**

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns <20%? Yes No **(N/A)**

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all non-detects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns <20%? Yes No **(N/A)**

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all non-detects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification? Yes No N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%? Yes No N/A

Have all standards been analyzed within 72 hours of any sample? Yes No N/A

Has a 3-point calibration been conducted for DDT or toxaphene? Yes No N/A

Have all standards been analyzed at the start of each 72h sequence? Yes No N/A

Have evaluation standards A, B, and C been analyzed within 72h of any sample? Yes No N/A

Has the confirmation standard mix been analyzed after every 5 samples? Yes No N/A

Has evaluation standard B analyzed every 10 samples? Yes No N/A

Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards? Yes No N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors < 10.0% (< 15.0% for the BHC series, DDT, endrin and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a non-compliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the non-compliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and non-detect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results as non-detects (U) that are <5X the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks? Yes No N/A

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5X the highest valid field blank concentrations as non-detects (U) and note the results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show non-detects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for non-detects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated non-detects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are greater than five times the CRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

No Detects

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations > 10 ppm? Yes No N/A

ACTION: If positive results do not meet the retention time criteria qualify all detected results as non-detects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and non-detected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within five times the CRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse	REVIEWER: SC	DATE: 2-22-93
LABORATORY: TMA	CASE:	SDG: B06M33
SAMPLES/MATRIX: S01		
B06M33, B06M34		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative	✓			
Cover Page		✓		
Traffic Reports		✓		
Sample Data				
Inorganic Analysis Data Sheets		✓		
Standards Data				
Initial and Continuing Calibration Verification	✓			
CRDL Standard for AA and ICP		✓		
QC Summary				
Blanks	✓			
ICP Interference Check Summary		✓		
Spike Sample Recovery			⊘	✓
Post-Digestion Spike Sample Recovery		✓		
Duplicate		✓		
Laboratory Control Sample				✓
Standard Addition Results				
ICP Serial Dilutions		✓		
Instrument Detection Limits		✓		
ICP Interelement Correction Factors	✓			
ICP Linear Ranges		✓		
Preparation Log		✓		
Analysis Run Log		✓		
Raw Data				
ICP Raw Data	✓			
Furnace AA Raw Data	✓			
Mercury Raw Data		✓		
Cyanide Raw Data		✓		
Additional Data				
Internal laboratory chain-of-custody	✓			
Laboratory Sample Preparation Records		✓		

Data Package Item	Present?:	Yes	No	N/A
Percent Solids Analysis Records		✓		
Reduction Formulae			✓	
Instrument Run Logs	✓			
Chemist Notebook Pages		✓		

2. HOLDING TIMES

Have all samples been analyzed within holding times? **Yes** No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for non-detects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? **Yes** No N/A

Are the correlation coefficients ≥0.995? **Yes** No N/A

Was a midrange CN standard distilled? **Yes** No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results > IDL as estimated (J) and results < IDL as estimated (UJ), if the correlation coefficient is < 0.995 or the laboratory did not distill the midrange CN standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? **Yes** No N/A

Are there calculation errors? Yes **No** N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? **Yes** No N/A

Are the AB solution %R values within control? **Yes** No N/A

Are there calculation errors? Yes **No** N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (U). If analyte concentrations in the blank are greater than the CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations less than 10x the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5X the amount in any valid field blank as non-detected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all non-detects as estimated (UJ). If spike recovery is <30%, reject all non-detects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required? Yes No N/A

Are MSA correlation coefficients $\geq$0.995? Yes No N/A

If no, was a second MSA analysis performed? Yes No N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for non-detects). If the analytical spike recovery is less than 40 percent qualify detects as estimated (J). If the analytical spike recovery is greater than or equal to 10% but less than 40 percent, qualify all non-detects as estimated (UJ) and if the analytical spike recovery is less than 10 percent, reject all non-detects (R). If the sample absorbance is less than 50% of the analytical spike absorbance and the analytical spike recovery is less than 85% or greater than 115%, qualify all results as estimated (J for detects and UJ for non-detects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was less than 0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly? Yes No N/A

Are results within the calibrated range of the instruments and within the linear range of the ICP? Yes No N/A

Are all detection limits below the CRQL? Yes No N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: Westinghouse	REVIEWER: SC	DATE: 2-23-93
LABORATORY: TMA	CASE:	SDG: B06M33
SAMPLES/MATRIX: SOIL		
B06M33, B06M34		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative	✓			
Cover Page		✓		
Traffic Reports/Chain-of-Custody		✓		
Sample Analysis Data Report Forms	✓			
Standards Data	✓			
QC Summary				
Blanks Summary Report Forms		✓		
Spike Sample Recovery Report Forms	✓			
Duplicate Sample Analysis Report Forms		✓		
Laboratory Control Sample Report Forms		✓		
Raw Data				
Ion Chromatograph Chromatograms	✓			
TOC and TOX Instrument Printouts			✓	
Laboratory Bench Sheets		✓		
Additional Data				
Laboratory Sample Preparation Logs	✓			
Instrument Run Logs	✓			
Internal Laboratory Chain-of-Custory	✓			
Percent Solids Analysis Records		✓		
Reduction Formulae			✓	
Chemist Notebook Pages		✓		

2. HOLDING TIMES

Were all samples analyzed within holding times? (Yes) No N/A

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for non-detects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Yes No N/A

Was a balance check conducted prior to the TDS analysis? Yes No N/A

Was the titrant normality checked? Yes No N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency? Yes No N/A

Are ICV and CCV percent recoveries within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5X the amount in any valid field blank as non-detected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits? Yes No N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are greater than the CRQL, qualify the data as estimated (J). If the spike recovery is less than 30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

DATA QUALIFICATION SUMMARY

UNIT: 100-KR-4

DOCUMENT CONTROL NUMBER: WHC-SD-EN-TI-134

ANALYSES: VOC, BNA, Pest/PCB, Inorganics, Wet Chemistry

RFW NO.: B06M33-TMA-225

SDG NO.: B06M33

QUALIFICATION SUMMARY:

VOLATILES

SAMPLE NUMBERS: B06M33, B06M34

BLANKS

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for acetone:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

SEMIVOLATILES

SAMPLE NUMBERS: B06M33, B06M34

HOLDING TIMES

The seven-day holding time was exceeded for sample numbers B06M33 and B06M34 in SDG No. B06M33. All associated sample results were qualified as estimates and flagged "J".

BLANKS

Due to the presence of di-n-butylphthalate in the laboratory blank, the following sample was flagged "U":

- Sample number B06M34 in SDG No. B06M33.

PESTICIDES/PCBS

SAMPLE NUMBERS: B06M33, B06M34

HOLDING TIMES

The seven-day holding time was exceeded, and the associated results were qualified as estimates and flagged "J" for the following samples:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

INITIAL CALIBRATIONS

Due to initial calibration RSDs above the QC limits, the following were qualified as estimates and flagged "J":

- Alpha-BHC, delta-BHC, gamma-BHC, dieldrin, 4,4'-DDE, 4,4'-DDD, endrin ketone, heptachlor, heptachlor epoxide, and endosulfan II in sample numbers B06M33 and B06M34 in SDG No. B06M33.

INORGANICS

SAMPLE NUMBERS: B06M33, B06M34

BLANKS

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for arsenic:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for cobalt:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for potassium:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

MATRIX SPIKE RECOVERY

The matrix spike recoveries fell outside the QC limits for antimony. All associated results were qualified as estimates and flagged "J" for the following samples:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

The matrix spike recoveries fell outside the QC limits for lead. All associated results were qualified as estimates and flagged "J" for the following samples:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

The matrix spike recoveries fell outside the QC limits for cyanide. All associated results were qualified as estimates and flagged "J" for the following samples:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

ICP SERIAL DILUTION

The ICP serial dilution results fell outside the QC limits for zinc. All associated results were qualified as estimates and flagged "J" for the following samples:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

ANALYTICAL SPIKE RECOVERY

The analytical spike recoveries fell outside the QC limits for selenium. All associated results were qualified as estimates and flagged "J" for the following samples:

- Sample numbers B06M33 and B06M34 in SDG No. B06M33.

The analytical spike recoveries fell outside the QC limits for thallium. All associated results were qualified as estimates and flagged "J" for the following sample:

- Sample number B06M34 in SDG No. B06M33.

WET CHEMISTRY

SAMPLE NUMBERS: B06M33

No qualifiers added to data.

Westinghouse Hanford Company

CHAIN OF CUSTODY ARL1

Custody Form Initiator: CMChance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 7-7-92

Ice Chest No.:

Field Logbook No.: EFL-1022

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M33
- ~~1,120ml aG:CLP;ICP/AA Metals,Hg~~
- ~~1,120ml aG:CLP;Cn~~
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- ~~1,1000ml aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241~~ 950 CC 7-7-92

2) B06M34
- ~~1,120ml aG:CLP;ICP/AA Metals,Hg~~
- ~~1,120ml aG:CLP;Cn~~
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- ~~1,1000ml aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241~~ 950 CC 7-7-92

3)
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 7-7-92

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

Relinquished by:	Received by:	Date/Time:
CMChance Cory Chance	Kermit Blum	7-9-92 1130
Kermit Blum 7-9-92	David Mitchell	7-10-92 0900

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector C M Chance Date 7-7-92

Company Contact CM CHANCE Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M33	S	7-7-92	0735	~~1-120ml aG CLP;ICP/AA Metals,Hg~~ ~~1-120ml aG CLP;CN~~ 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) ~~1-1000ml aG Gross alpha/beta,Gamma Spec,Sr-90,C-14~~ ~~950 CC 7-7-92 U-235/238,Pu-239/240,Am-241~~
B06M34	S	7-7-92	0925	~~1-120ml aG CLP;ICP/AA Metals,Hg~~ ~~1-120ml aG CLP;CN~~ 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) ~~1-1000ml aG Gross alpha/beta,Gamma Spec,Sr-90,C-14~~ ~~950 CC 7-7-92 U-235/238,Pu-239/240,Am-241~~
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
CC 7-7-92				

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

9213517.0252

000005

EPA SAMPLE NO.

B06M33

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

ab Name: TMA/ARLI Contract: WHC

ab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

atrix: (soil/water) SOIL Lab Sample ID: A207016-01A

ample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R03

evel: (low/med) LOW Date Received: 07/09/92

Moisture: not dec. 2 Date Analyzed: 07/14/92

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

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

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

2-17-93

6/22/93

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EPA SAMPLE NO.

B06M35

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

ab Name: TMA/ARLI Contract: WHC

ab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

atrix: (soil/water) SOIL Lab Sample ID: A207016-01A

ample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R03

evel: (low/med) LOW Date Received: 07/09/92

Moisture: not dec. 2 Date Analyzed: 07/14/92

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

oil 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.	SUBST. ALKANE	29.33	10	J

2-17-93

MM

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000007
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R06

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: not dec. 4 Date Analyzed: 07/14/92

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	J
67-64-1	Acetone	25	~~B~~ U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	7	J
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	2	J
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	2	J
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

2-17-9

FORM I VOA

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000008

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B06M34

ab Name: TMA/ARLI Contract: WHC

ab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

atrix: (soil/water) SOIL Lab Sample ID: A207016-02A

ample wt/vol: 5.0 (g/mL) G Lab File ID: 20714R06

evel: (low/med) LOW Date Received: 07/09/92

Moisture: not dec. 4 Date Analyzed: 07/14/92

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

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

2-17-93

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000009

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M33

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 20727N07

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 2 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	800	U

2-17-92 MY

PBD 6/22/

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000010
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B06M33

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 20727N07

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 2 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-02-7	4-Nitrophenol	800	U J
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
218-01-9	Chrysene	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

2-17-9
MM

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 3/90

4/22/93

EPA SAMPLE NO.

B06M33

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-01D

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 20727N07

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 2 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.5

Number TICs found: 13

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Ketone	4.22	470	~~BJ~~ U
2.	Unknown Alkene	4.92	170	~~BJ~~
3.	Unknown Hydrocarbon	5.57	100	~~BJ~~
4.	Unknown Hydrocarbon	5.75	130	~~BJ~~
5.	Unknown Hydrocarbon	5.82	130	~~BJ~~
6.	Unknown Hydrocarbon	6.15	3000	~~BJ~~
7.	Unknown Hydrocarbon	6.80	32000	~~BJ~~
8.	Unknown Alkane	6.88	300	J
9.	Unknown Hydrocarbon	7.00	300	~~BJ~~ U
10.	Unknown Hydrocarbon	7.47	66	J
11.	Unknown Hydrocarbon	8.05	1100	~~BJ~~ U
12.	Unknown Hydrocarbon	9.42	170	~~BJ~~ U
13.	Unknown Alcohol	9.80	66	~~BJ~~ U

2-17-

PBD 6/22/93

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 20727N08

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 4 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

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) UG/KG	Q
108-95-2	Phenol	340	U J
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	830	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	340	U
51-28-5	2,4-Dinitrophenol	830	U

2-17-93 MM

9213517.0260

000013
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 20727N08

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 4 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

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) UG/KG	Q
100-02-7	4-Nitrophenol	830	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	830	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	340 ~~53~~	~~B~~ U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
218-01-9	Chrysene	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

2-17-9 NM

(1) - Cannot be separated from Diphenylamine

PBD 6/22/93

9213517.0261

000014.
EPA SAMPLE NO.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B06M34

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

Matrix: (soil/water) SOIL Lab Sample ID: A207016-02B

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 20727N08

Level: (low/med) LOW Date Received: 07/09/92

% Moisture: 4 decanted: (Y/N) N Date Extracted: 07/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 07/27/92

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 13

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Ketone	4.22	310	~~BJ~~ U
2.	Unknown Alkene	4.92	170	~~BJ~~ U
3.	Unknown Hydrocarbon	5.57	170	J
4.	Unknown Hydrocarbon	5.75	140	~~BJ~~ U
5.	Unknown Hydrocarbon	5.82	140	~~BJ~~
6.	Unknown Hydrocarbon	6.15	3000	~~BJ~~
7.	Unknown Hydrocarbon	6.25	1800	~~BJ~~
8.	Unknown Hydrocarbon	6.87	47000	~~BJ~~
9.	Unknown Hydrocarbon	7.02	310	~~BJ~~
10.	Unknown Hydrocarbon	7.48	170	J
11.	Unknown Hydrocarbon	8.08	1700	~~BJ~~ U
12.	Unknown Ketone	8.47	100	~~BJ~~
13.	Unknown Ketone	8.58	280	~~BJ~~

2-17-

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M33

ab Name: TMA/ARLI Contract: WHC

ab Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

atrix: (soil/water) SOIL Lab Sample ID: A207016-01D

ample wt/vol: 30.6 (g/mL) G Lab File ID:

Moisture: 2 decanted: (Y/N) N Date Received: 07/09/92

xtraction: (SepF/Cont/Sonc) SONC Date Extracted: 07/15/92

oncentrated Extract Volume: 5000 (uL) Date Analyzed: 08/06/92

njection Volume: 1.00 (uL) Dilution Factor: 1.00

PC Cleanup: (Y/N) Y pH: 9.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.7	UJ
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-36-3	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
8001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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PD 6/22/93

9213517.0263

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B06M34

) Name: TMA/ARLI Contract: WHC

) Code: TMALA Case No.: 07016 SAS No.: NA SDG No.: NA

:rix: (soil/water) SOIL Lab Sample ID: A207016-02B

mple wt/vol: 30.3 (g/mL) G Lab File ID:

Moisture: 4 decanted: (Y/N) N Date Received: 07/09/92

:traction: (SepF/Cont/Sonc) SONC Date Extracted: 07/15/92

ncentrated Extract Volume: 5000 (uL) Date Analyzed: 08/06/92

jection Volume: 1.00 (uL) Dilution Factor: 1.00

C Cleanup: (Y/N) Y pH: 9.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	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	3.4	U
72-55-9	4,4'-DDE	3.4	U
72-20-8	Endrin	3.4	U
33213-65-9	Endosulfan II	3.4	U
72-54-8	4,4'-DDD	3.4	U
1031-07-8	Endosulfan sulfate	3.4	U
50-29-3	4,4'-DDT	3.4	U
72-43-5	Methoxychlor	18	U
53494-70-5	Endrin ketone	3.4	U
7421-36-3	Endrin aldehyde	3.4	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	34	U
11104-28-2	Aroclor-1221	69	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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6/22/93

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B06M33

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-034SAS No.: SDG No.: B06M33

Matrix (soil/water): SOIL Lab Sample ID: 07057-01S

Level (low/med): LOW Date Received: 07/10/92

% Solids: 96.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6380.00			P
7440-36-0	Antimony	3.30	U	~~N~~ J	P
7440-38-2	Arsenic	1.20	~~B~~	U	F
7440-39-3	Barium	65.90			P
7440-41-7	Beryllium	0.14	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	4300.00			P
7440-47-3	Chromium	11.20			P
7440-48-4	Cobalt	6.80	~~B~~	U	P
7440-50-8	Copper	16.50			P
7439-89-6	Iron	14900.00			P
7439-92-1	Lead	4.10		~~N~~ J	F
7439-95-4	Magnesium	3730.00			P
7439-96-5	Manganese	263.00			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.50			P
7440-09-7	Potassium	945.00	~~B~~	U	P
7782-49-2	Selenium	0.63	U	~~N~~ J	F
7440-22-4	Silver	0.96	U		P
7440-23-5	Sodium	271.00	B		P
7440-28-0	Thallium	0.88	U		F
7440-62-2	Vanadium	29.50			P
7440-66-6	Zinc	39.60		~~E~~ J	P
	Cyanide	0.52	U	~~N~~ J	CA

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES

6/22/93

9215517.0265

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B06M34

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-07-034SAS No.: SDG No.: B06M33

Matrix (soil/water): SOIL Lab Sample ID: 07057-02S

Level (low/med): LOW Date Received: 07/10/92

% Solids: 98.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7700.00			P
7440-36-0	Antimony	3.20	U	~~N~~ J.	P
7440-38-2	Arsenic	0.93	~~B~~	U.	F
7440-39-3	Barium	85.00			P
7440-41-7	Beryllium	0.14	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	3730.00			P
7440-47-3	Chromium	21.20			P
7440-48-4	Cobalt	7.10	~~B~~	U.	P
7440-50-8	Copper	20.50			P
7439-89-6	Iron	11700.00			P
7439-92-1	Lead	2.80		~~N~~ J.	F
7439-95-4	Magnesium	4060.00			P
7439-96-5	Manganese	210.00			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	15.50			P
7440-09-7	Potassium	965.00	~~B~~	U.	P
7782-49-2	Selenium	0.60	U	~~W~~ J.	F
7440-22-4	Silver	0.95	U		P
7440-23-5	Sodium	509.00	B		P
7440-28-0	Thallium	0.83	U	~~W~~ J	F
7440-62-2	Vanadium	23.20			P
7440-66-6	Zinc	28.00		~~E~~ J	P
	Cyanide	0.51	U	~~N~~ J.	CA

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:

6/22/98

0003

FORM I - IN Rev.6/89

TMA Inc. REPORT Work Order # A2-07-016

Received: 07/09/92

Results by Sample

SAMPLE ID B06M33 FRACTION 01E TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 07/07/92 Category

1517

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	2	mg/Kg	1.0
Sulfate	300.0	44	mg/Kg	10

FORM I

2-22-93 SC

PBD 6/22/93

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000011

TA Inc. REPORT Work Order # A2-07-016

Received: 07/09/92

Results by Sample

SAMPLE ID B06M34 FRACTION 02E TEST CODE WCCLPS NAME Anions in Solids - WM232

Date & Time Collected 07/07/92 Category

ANIONS AND WET CHEMISTRY - SOLIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	2	mg/Kg	1.0
Sulfate	300.0	48	mg/Kg	10

FORM I

2-2-93 SC

PBT
6/22/93

9213517.0268

Received: 07/10/92 Results by Sample

SAMPLE ID B06M33 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 07/07/92 07:35:00 Category SOIL

NO3NO2 3.24
mg N/kg

method 353.2

SAMPLE ID B06M33D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 07/07/92 07:35:00 Category SOIL

NO3NO2 <2.49
mg N/kg

SAMPLE ID B06M33S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 07/07/92 07:35:00 Category SOIL

NO3NO2 20.7
mg N/kg

SAMPLE ID B06M34 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 07/07/92 09:25:00 Category SOIL

NO3NO2 <2.42 U
mg N/kg

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

NO3NO2 1.92
mg N/L

2-22-93 SC

PBD
6/22/93

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.
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1-800-4LAB TEST FAX (617) 890-3883

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: Westinghouse Data Validation	REVIEWER: MM	DATE: 2-16-93
LABORATORY: IMA	CASE: 07016	SDG: B06M33
SAMPLES/MATRIX: Soils; B06M33, B06M34		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓	—	—
Data Summary	✓	—	—
Chain-of-Custody	✓	—	—
QC Summary			
Surrogate report	✓	—	—
MS/MSD report	✓	—	—
Blank summary report	✓	—	—
GC/MS tuning report	✓	—	—
Internal standard summary report	✓	—	—
Sample Data			
Sample reports	✓	—	—
TIC reports for each sample	✓	—	—
RIC reports for all samples	✓	—	—
Raw and corrected spectra for all detected results	✓	—	—
Raw and corrected library search data for all reported TIC	✓	—	—
Quantitation and calculation data for all TIC	✓	—	—
Standards Data			
Initial calibration report	✓	—	—
RIC and quantitation reports for initial calibration	✓	—	—
Continuing calibration reports	✓	—	—
RIC and quantitation reports for cont. calibrations	✓	—	—
Internal standard summary report	✓	—	—
Raw QC Data			
Tuning report, spectra and mass lists	✓	—	—
Blank analysis reports	✓	—	—
TIC reports for all blanks	✓	—	—
RIC and quantitation reports for blanks	✓	—	—
Raw and corrected spectra for all detected results in blanks	✓	—	—
Raw and corrected library search data for all reported TIC	✓	—	—

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for non-detects), otherwise reject all non-detects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a BFB tune report present for each applicable 12h period? (Yes) No N/A

Do all tunes on all instruments meet the tuning criteria? (Yes) No N/A

Do all tunes on all instruments meet the expanded criteria? (Yes) No N/A

Has the laboratory made any calculation or transciption errors? Yes (No) N/A

Have the proper significant figures been reported? (Yes) No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for non-detects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? (Yes) No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes No (N/A)

Are all RRF values ≥0.05 (2/88 SOW)? Yes No (N/A)

Are all applicable RSD values ≤~~20.5%~~ 25.0% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed ?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is < CRQL. Qualify all remaining sample results <5X the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No (N/A)

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes (No) N/A

Are any surrogate recoveries less than 10%? Yes (No) N/A

Are any method blank surrogate recoveries out of specification? Yes (No) N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for non-detects) for surrogates out of specification but greater than 10%. Qualify all associated positive sample results as estimated (J) and all non-detect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? (Yes) No N/A

Are MS/MSD recoveries within specification? (Yes) No N/A

Are there any calculation errors? Yes (No) N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is greater than five times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and not the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are greater than five times the CRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for non-detects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard? Yes No N/A

Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra? Yes No N/A

Do the relative intensities between the standard and sample spectra agree within 20%? Yes No N/A

Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination? Yes No N/A

Are molecular ions present in the reference specrum present in the sample spectrum? Yes No N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation? Yes No N/A

Are results and quantitation limits calculated properly? Yes No N/A

Has the laboratory reported the sample quantitation limits within five times the CRQL values? Yes No N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW? Yes No N/A

Has the laboratory properly identified and coded all TIC? Yes No N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as non-detects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as non-detects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

9713512.0277

DATA QUALIFICATION SUMMARY

UNIT: 100-KR-4

DOCUMENT CONTROL NUMBER: WHC-SD-EN-TI-134

ANALYSES: Radiochemistry

RFW NO.: B06M33-TMA-225

SDG NO.: B06M33

QUALIFICATION SUMMARY:

SAMPLE NUMBERS: B06M33, B06M34, B06M50, B06M57

GROSS ALPHA AND GROSS BETA DETERMINATION

INSTRUMENT CALIBRATION AND PERFORMANCE

Due to efficiencies below the QC minimum, all gross alpha sample results for SDG No. B06M33 were rejected and flagged "R".

ALPHA SPECTROSCOPY

ACCURACY

Due to low LCS recoveries, all Plutonium and Americium-241 results in SDG No. B06M33 were qualified as estimates and flagged "J".

GAMMA SPECTROSCOPY

No qualifiers added to data.

STRONTIUM-90

ACCURACY

Due to low LCS recoveries, all Strontium-90 results in SDG No. B06M33 were qualified as estimates and flagged "J".

TECHNETIUM-99

No qualifiers added to data.

CARBON-14

ACCURACY

9713517.0278

Due to high LCS recovery results, Carbon-14 results in all samples in SDG No. B06M33 were rejected and flagged "R".

TRITIUM

No qualifiers added to data.

9213517.0229

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: CM Chance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 6-25-92

Ice Chest No.: SML-77

Field Logbook No.: EFL-1021

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M5D
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,~~1000ml~~ 950 aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241 6-25-92

2)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241
CC 6-25-92

3)
1,120ml G:CLP;ICP/AA Metals,Hg
1,120ml G:CLP;Cn
1,120ml aG:CLP;VOA
1,250ml aG:CLP;Semi-VOA,PCB/PEST
1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

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

Relinquished by:	Received by:	Date/Time:
CM Chance / Cory Chance	Kermit Blum	6-29-92 0800 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received @ TMA/Norcal 6-27-92 @ 1300; opened 6-29-92. KB

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: CM Chance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 6-29-92

Ice Chest No.: SML-113

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M57
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

2)
- 1,120ml G:CLP;ICP/AA Metals,Hg
- 1,120ml G:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

3)
- 1,120ml G:CLP;ICP/AA Metals,Hg
- 1,120ml G:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 6-29-92

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

Relinquished by:	Received by:	Date/Time:
CM Chance / Cory Chance	Kermit Blum	7-6-92 0800 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received 7-2-92 @ 1735 @ TMA/NORCAL (after regular work hours). Opened 7-6-92. KB

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

9215217.0281

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector CM Chance Date 6-29-92

Company Contact CM CHANCE Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M57	S	6-29-92	0852	1-120ml aG CLP;ICP/AA Metals,Hg 1-120ml aG CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
	CC	6-29-92		

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: CMChance

Company Contact: CM CHANCE

Telephone: 376-7619

Project Designation/Sampling Locations: 100-KR-4

Collection Date: 7-7-92

Ice Chest No.:

Field Logbook No.: EFL-1022

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: None detected with field instruments. Maintain at 4C.

Sample Identification

1) B06M33
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,~~1000ml~~ 950 CC 7-7-92 aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

2) B06M34
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,~~1000ml~~ 950 CC 7-7-92 aG:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

3)
- 1,120ml aG:CLP;ICP/AA Metals,Hg
- 1,120ml aG:CLP;Cn
- 1,120ml aG:CLP;VOA
- 1,250ml aG:CLP;Semi-VOA,PCB/PEST
- 1,120ml aG:300.0/353.2;Anions(F,SO4,NO3)
- 1,1000ml G:Gross alpha/beta,Gamma Spec,Sr-90,C-14,U-235/238,Pu-239/240,Am-241

CC 7-7-92

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: CMChance Cory Chance	Received by: Kermit Blum	Date/Time: 7-9-92 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9216517.0283

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector C M Chance Date 7-7-92

Company Contact CM CHANCE Telephone (509)376-7619

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B06M33	S	7-7-92	0735	1-120ml aG CLP;ICP/AA Metals,Hg 1-120ml aG CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-~~1000ml~~ aG Gross alpha/beta,Gamma Spec,Sr-90,C-14 950 CC 7-9-92 U-235/238,Pu-239/240,Am-241
B06M34	S	7-7-92	0925	1-120ml aG CLP;ICP/AA Metals,Hg 1-120ml aG CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-~~1000ml~~ aG Gross alpha/beta,Gamma Spec,Sr-90,C-14 950 CC 7-9-92 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
				1-120ml G CLP;ICP/AA Metals,Hg 1-120ml G CLP;CN 1-120ml aG CLP;VOA 1-250ml aG CLP;Semi-VOA,PCB/PEST 1-120ml aG 300.0/353.2;Anions(F,SO4,NO3) 1-1000ml G Gross alpha/beta,Gamma Spec,Sr-90,C-14 U-235/238,Pu-239/240,Am-241
	CC 7-9-92			

*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 FROM 100-KR-4 Drilling

Special Handling and/or Storage Maintain at 4C

Possible Sample Hazards NA

A-6000-406 (06/91) WEF060

9713517.028H

000017

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-03

B06M33

SDG 7053
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-03
Dept sample id 7053-003
Received 07/09/92

Client sample id B06M33
Matrix SOIL
Collected 07/07/92
Chain of custody id EFL 1022

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	5.9	4.1	4.7	10	JR	80A
Gross Beta	Beta	13	4.5	6.3	15	J	80B
Uranium 233/234		0.37	0.17	0.12	0.30		U
Uranium 235	15117-96-1	0.019	0.039	0.15	0.30	U	U
Uranium 238	7440-61-1	0.29	0.13	0.12	0.30	J	U
Plutonium 239/240		0	0.005	0.019	0.050	UJ	PU
Americium 241	14596-10-2	-0.007	0.009	0.021	0.050	UJ	AM
Strontium 90	10098-97-2	-0.17	0.83	0.85	2.0	UJ	Y
Carbon 14	14762-75-5	-0.97	7.4	12	50	UR	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	1.6				GAM
Iron 59		U		0.53		U	GAM
Chromium 51	14392-02-0	U		1.4		U	GAM
Cobalt 60	10198-40-0	U		0.086		U	GAM
Zinc 65	17982-39-3	U		0.19		U	GAM
Ruthenium 106	13967-48-1	U		0.74		U	GAM
Cesium 134	17967-70-9	U		0.10		U	GAM
Cesium 137	10045-97-3	U		0.082		U	GAM
Europium 152	14683-23-9	U		0.15		U	GAM
Europium 154	15585-10-1	U		0.098		U	GAM
Radium 226	13982-67-7	0.40	0.16				GAM
Thorium 228	14274-82-9	0.65	0.11				GAM
Thorium 232	7440-29-1	0.50	0.34				GAM

RB 2/4/93

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

RD 6/22/93

9713517.0285

000012

N206166-04

TMA NORCAL
REPORTING GROUP 7053
DATA SHEET

B06M34

SDG 7053
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-04
Dept sample id 7053-004
Received 07/09/92
Client sample id B06M34
Matrix SOIL
Collected 07/07/92
Chain of custody id EFL 1022

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	2.9	4.1	5.7	10	~~J~~R	80A
Gross Beta	Beta	13	4.1	5.5	15	J	80B
Uranium 233/234		0.27	0.15	0.18	0.30	J	U
Uranium 235	15117-96-1	0.029	0.059	0.22	0.30	U	U
Uranium 238	7440-61-1	0.24	0.15	0.18	0.30	J	U
Plutonium 239/240		0.15	0.043	0.028	0.050		PU
Americium 241	14596-10-2	0.23	0.062	0.050	0.050	J	AM
Strontium 90	10098-97-2	0.15	0.25	0.94	2.0	UJ	Y
Carbon 14	14762-75-5	5.3	8.1	13	50	~~J~~R	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	9.2	0.71				GAM
Iron 59		U		0.17		U	GAM
Chromium 51	14392-02-0	U		0.54		U	GAM
Cobalt 60	10198-40-0	U		0.032		U	GAM
Zinc 65	17982-39-3	U		0.094		U	GAM
Ruthenium 106	13967-48-1	U		0.27		U	GAM
Cesium 134	17967-70-9	U		0.057		U	GAM
Cesium 137	10045-97-3	U		0.037		U	GAM
Europium 152	14683-23-9	U		0.078		U	GAM
Europium 154	15585-10-1	U		0.050		U	GAM
Radium 226	13982-67-7	0.39	0.073				GAM
Thorium 228	14274-82-9	0.74	0.073				GAM
Thorium 232	7440-29-1	0.55	0.15				GAM

RB 2/4/93

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

6/22/93

9713517.0286

000019

N206166-01

TMA NORCAL
REPORTING GROUP 7053
DATA SHEET

B06M50

SDG 7053
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-01
Dept sample id 7053-001
Received 06/29/92
Client sample id B06M50
Matrix SOIL
Collected 06/25/92
Chain of custody id EFL 1021

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALIFIERS	TEST
Gross Alpha	Alpha	-0.77	3.4	5.8	10	~~J~~R	80A
Gross Beta	Beta	13	3.9	5.2	15	J	80B
Uranium 233/234		0.44	0.23	0.21	0.30		U
Uranium 235	15117-96-1	0	0.053	0.20	0.30	U	U
Uranium 238	7440-61-1	0.59	0.24	0.17	0.30		U
Plutonium 239/240		0.017	0.017	0.032	0.050	UJ	PU
Americium 241	14596-10-2	-0.007	0.026	0.055	0.050	UJ	AM
Strontium 90	10098-97-2	0	2.2	0.81	2.0	UJ	Y
Carbon 14	14762-75-5	4.1	12	19	50	~~J~~R	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	1.7				GAM
Chromium 51	14392-02-0	U		2.0		U	GAM
Cobalt 60	10198-40-0	U		0.11		U	GAM
Zinc 65	17982-39-3	U		0.29		U	GAM
Ruthenium 106	13967-48-1	U		0.83		U	GAM
Cesium 134	17967-70-9	U		0.14		U	GAM
Cesium 137	10045-97-3	U		0.10		U	GAM
Europium 152	14683-23-9	U		0.17		U	GAM
Europium 154	15585-10-1	U		0.11		U	GAM
Radium 226	13982-67-7	0.49	0.19				GAM
Thorium 228	14274-82-9	0.53	0.19				GAM
Thorium 232	7440-29-1	0.63	0.46				GAM

RJS 8/4/9

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

6/22/93

9715547.0287

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TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-02

B06M57

SDG	7053	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N206166-02	Client sample id	B06M57
Dept sample id	7053-002	Matrix	SOIL
Received	07/06/92	Collected	06/29/92
		Chain of custody id	EFL 1021

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	4.9	4.6	5.8	10	~~J~~R	80A
Gross Beta	Beta	12	4.3	6.1	15	J	80B
Uranium 233/234		0.53	0.24	0.18	0.30		U
Uranium 235	15117-96-1	0	0.056	0.21	0.30	U	U
Uranium 238	7440-61-1	0.48	0.24	0.18	0.30		U
Plutonium 239/240		-0.002	0.008	0.019	0.050	UJ	PU
Americium 241	14596-10-2	-0.002	0.007	0.017	0.050	UJ	AM
Strontium 90	10098-97-2	0.23	0.26	0.96	2.0	UJ	Y
Carbon 14	14762-75-5	24	11	17	50	~~J~~R	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	0.81				GAM
Iron 59		U		0.24		U	GAM
Chromium 51	14392-02-0	U		0.72		U	GAM
Cobalt 60	10198-40-0	U		0.041		U	GAM
Zinc 65	17982-39-3	U		0.10		U	GAM
Ruthenium 106	13967-48-1	U		0.35		U	GAM
Cesium 134	17967-70-9	U		0.043		U	GAM
Cesium 137	10045-97-3	U		0.038		U	GAM
Europium 152	14683-23-9	U		0.084		U	GAM
Europium 154	15585-10-1	U		0.056		U	GAM
Radium 226	13982-67-7	0.48	0.074				GAM
Thorium 228	14274-82-9	0.62	0.049				GAM
Thorium 232	7440-29-1	0.50	0.16				GAM

MB 2/4/93

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.15
Report date	09/08/92

BD 6/22/93

9713517.0288 WC 000017

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-03

B06M33

SDG 7053
Contact Dinkar Kharkar
Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-03
Dept sample id 7053-003
Received 07/09/92
Client sample id B06M33
Matrix SOIL
Collected 07/07/92
Chain of custody id EFL 1022

9/25/92 eAD

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALIFIERS	TEST
Gross Alpha	Alpha	5.9	4.1	4.7	10	JR	80A
Gross Beta	Beta	13	4.5	6.3	15	J	80B
Uranium 233/234		0.37	0.17	0.12	0.30		U
Uranium 235	15117-96-1	0.019	0.039	0.15	0.30	U	U
Uranium 238	7440-61-1	0.29	0.13	0.12	0.30	J	U
Plutonium 239/240		0	0.005	0.019	0.050	UJ	PU
Americium 241	14596-10-2	-0.007	0.009	0.021	0.050	UJ	AM
Strontium 90	10098-97-2	-0.17	0.83	0.85	2.0	UJ	Y
Carbon 14	14762-75-5	-0.97	7.4	12	50	R	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	1.6				GAM
Iron 59		U		0.53		U	GAM
Chromium 51	14392-02-0	U		1.4		U	GAM
Cobalt 60	10198-40-0	U		0.086		U	GAM
Zinc 65	17982-39-3	U		0.19		U	GAM
Ruthenium 106	13967-48-1	U		0.74		U	GAM
Cesium 134	17967-70-9	U		0.10		U	GAM
Cesium 137	10045-97-3	U		0.082		U	GAM
Europium 152	14683-23-9	U		0.15		U	GAM
Europium 154	15585-10-1	U		0.098		U	GAM
Radium 226	13982-67-7	0.40	0.16				GAM
Thorium 228	14274-82-9	0.65	0.11				GAM
Thorium 232	7440-29-1	0.50	0.34				GAM

eff C26

LCS low
LCS low
LCS low
LCS hig

RB 9/4/

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-04

B06M34

WC

SDG 7053
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N206166-04
Dept sample id 7053-004
Received 07/09/92

Client sample id B06M34
Matrix SOIL
Collected 07/07/92
Chain of custody id EFL 1022

8/25/92 = MD

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
Gross Alpha	Alpha	2.9	4.1	5.7	10	~~UR~~	80A
Gross Beta	Beta	13	4.1	5.5	15	J	80B
Uranium 233/234		0.27	0.15	0.18	0.30	J	U
Uranium 235	15117-96-1	0.029	0.059	0.22	0.30	U	U
Uranium 238	7440-61-1	0.24	0.15	0.18	0.30	J	U
Plutonium 239/240		0.15	0.043	0.028	0.050	~~J~~	PU
Americium 241	14596-10-2	0.23	0.062	0.050	0.050	~~J~~	AM
Strontium 90	10098-97-2	0.15	0.25	0.94	2.0	~~UJ~~	Y
Carbon 14	14762-75-5	5.3	8.1	13	50	~~UR~~	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	9.2	0.71				GAM
Iron 59		U		0.17		U	GAM
Chromium 51	14392-02-0	U		0.54		U	GAM
Cobalt 60	10198-40-0	U		0.032		U	GAM
Zinc 65	17982-39-3	U		0.094		U	GAM
Ruthenium 106	13967-48-1	U		0.27		U	GAM
Cesium 134	17967-70-9	U		0.057		U	GAM
Cesium 137	10045-97-3	U		0.037		U	GAM
Europium 152	14683-23-9	U		0.078		U	GAM
Europium 154	15585-10-1	U		0.050		U	GAM
Radium 226	13982-67-7	0.39	0.073				GAM
Thorium 228	14274-82-9	0.74	0.073				GAM
Thorium 232	7440-29-1	0.55	0.15				GAM

eff L20

LCS low

LCS hi

RB 2/4/92

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.15
Report date 09/08/92

TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-01

B06M50

WC

SDG	7053	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N206166-01	Client sample id	B06M50
Dept sample id	7053-001	Matrix	SOIL
Received	06/29/92	Collected	06/25/92
		Chain of custody id	EFL 1021

8/25/92 = AO

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALIFIERS	TEST
Gross Alpha	Alpha	-0.77	3.4	5.8	10	~~UR~~	80A
Gross Beta	Beta	13	3.9	5.2	15	J	80B
Uranium 233/234		0.44	0.23	0.21	0.30		U
Uranium 235	15117-96-1	0	0.053	0.20	0.30	U	U
Uranium 238	7440-61-1	0.59	0.24	0.17	0.30		U
Plutonium 239/240		0.017	0.017	0.032	0.050	UJ	PU
Americium 241	14596-10-2	-0.007	0.026	0.055	0.050	UJ	AM
Strontium 90	10098-97-2	0	2.2	0.81	2.0	UJ	Y
Carbon 14	14762-75-5	4.1	12	19	50	~~UR~~	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	1.7				GAM
Chromium 51	14392-02-0	U		2.0		U	GAM
Cobalt 60	10198-40-0	U		0.11		U	GAM
Zinc 65	17982-39-3	U		0.29		U	GAM
Ruthenium 106	13967-48-1	U		0.83		U	GAM
Cesium 134	17967-70-9	U		0.14		U	GAM
Cesium 137	10045-97-3	U		0.10		U	GAM
Europium 152	14683-23-9	U		0.17		U	GAM
Europium 154	15585-10-1	U		0.11		U	GAM
Radium 226	13982-67-7	0.49	0.19				GAM
Thorium 228	14274-82-9	0.53	0.19				GAM
Thorium 232	7440-29-1	0.63	0.46				GAM

eff

low L
LCS hig

MB
2/14/93

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.15
Report date	09/08/92

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TMA NORCAL

REPORTING GROUP 7053

DATA SHEET

N206166-02

B06M57

SDG	7053	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N206166-02	Client sample id	B06M57
Dept sample id	7053-002	Matrix	SOIL
Received	07/06/92	Collected	06/29/92
		Chain of custody id	EFL 1021

8/25/92 = AA

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALIFIERS	TEST
Gross Alpha	Alpha	4.9	4.6	5.8	10	~~J~~R	80A
Gross Beta	Beta	12	4.3	6.1	15	J	80B
Uranium 233/234		0.53	0.24	0.18	0.30		U
Uranium 235	15117-96-1	0	0.056	0.21	0.30	U	U
Uranium 238	7440-61-1	0.48	0.24	0.18	0.30		U
Plutonium 239/240		-0.002	0.008	0.019	0.050	UJ	PU
Americium 241	14596-10-2	-0.002	0.007	0.017	0.050	UJ	AM
Strontium 90	10098-97-2	0.23	0.26	0.96	2.0	UJ	Y
Carbon 14	14762-75-5	24	11	17	50	~~J~~R	C
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	11	0.81				GAM
Iron 59		U		0.24		U	GAM
Chromium 51	14392-02-0	U		0.72		U	GAM
Cobalt 60	10198-40-0	U		0.041		U	GAM
Zinc 65	17982-39-3	U		0.10		U	GAM
Ruthenium 106	13967-48-1	U		0.35		U	GAM
Cesium 134	17967-70-9	U		0.043		U	GAM
Cesium 137	10045-97-3	U		0.038		U	GAM
Europium 152	14683-23-9	U		0.084		U	GAM
Europium 154	15585-10-1	U		0.056		U	GAM
Radium 226	13982-67-7	0.48	0.074				GAM
Thorium 228	14274-82-9	0.62	0.049				GAM
Thorium 232	7440-29-1	0.50	0.16				GAM

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ACS Cm

hi LCS

RB 2/4/

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.15
Report date	09/08/92

RADIOLOGICAL DATA VALIDATION CHECKLIST

PROJECT: Westinghouse-Hanford	REVIEWER: RB	DATE:
LABORATORY: TMA	CASE: N/A	SDG: B06M33
SAMPLES/MATRIX: Four soils -		
B06M33		
B06M34		
B06M50		
B06M57		

6.1 COMPLETENESS CHECKS

Begin by examining the data package for completeness. Use the checklists included in the Appendices, but also refer to the Statement of Work (SOW) for the analytical laboratory. Items specified in the SOW may supplement or take precedence over the list of items in the checklists.

Evaluation Criteria and Actions

Verify that the items listed in the SOW, if available, and the Method Specific Appendices are included in the data package. These items may be recorded in various ways, and the data package may be organized differently than this procedure, so some searching may be required. Information that pertains to a requirement that is associated with an **R** qualifier, e.g., initial calibration, is classed as major, and its lack would be a major deficiency. A minor deficiency would result from a lack of information associated with a **J** qualifier, e.g., duplicates. The validator may have to use professional judgement to classify some deficiencies.

If minor deficiencies are encountered and can not be rectified by the laboratory, then generally all affected (associated) data must be qualified as estimated (J). Major deficiencies that can not be rectified will require that all affected data be qualified as unusable (R). The validator may use other qualifiers, but their definition must be included in the data validation report. If the validator concludes that no qualification is necessary, the reason must be included in the data validation report.

Indicate whether the following articles are present. Insert a "Y" if the corresponding item is in the data packet, an "N" if it is absent, or "N/A" if the item does not apply to the analysis:

Checklist:

✓ Case Narrative
✓ Chain of Custody

6.1.A COMPLETENESS CHECKLIST FOR ANALYSES USING GAS PROPORTIONAL COUNTERS

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- ✓ Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

6.1.B COMPLETENESS CHECKLIST FOR ANALYSES USING ALPHA SPECTROSCOPY

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted (Precipitated or Deposited)

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Spectra or Counts per Channel
- ✓ Kev/channel
- ✓ Count Duration for Standards
- ✓ Efficiencies
- ✓ Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

6.1.C COMPLETENESS CHECKLIST FOR GAMMA SPECTROSCOPY

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification and Counting Position
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Efficiencies and/or Geometry and Matrix Factors
- ✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
- ✓ Kev/Channel
- ✓ FWHM

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank
- ✓ Raw Data

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analyses and Calculated Precision
- ✓ Raw Data

Radiometric and Gravimetric Yields

- N/A Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

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6.1.D COMPLETENESS CHECKLIST - ALPHA-EMITTING RADIUM ISOTOPES USING SCINTILLATION COUNTING

Analysis Results

_____ Results Report for Sample Analyses and Reanalyses
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
_____ Calculation Sheets
_____ Sample Identifications
_____ Detector Identification and Counting Position
_____ Analysis Date and Analyst Initials
_____ Sample Weight

Initial and Continuing Instrument Calibration

_____ Detector Identification
_____ Calibration Dates and Analyst Initials
_____ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Data and Activity
_____ Amount of Standard Used for Calibration
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
_____ Routine Control Charts

Blanks

_____ Detector Identification
_____ Date of Analysis
_____ MDA of Method
_____ Amounts of Reagents Used
_____ Lot Numbers of Reagents Used
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)

Duplicates

_____ Detector Identification
_____ Date of Analysis
_____ Sample Weight
_____ Amount of Spike for Spiked Duplicates
_____ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric and Gravitimetric Yields

_____ Amount of Spike Used for Spiked Samples
_____ Amount of Radium Standard Used for Radiometric Yield Determination
_____ NIST Certification for Radium Standards
_____ Calculated Radiometric Yield
_____ Weight of Carrier Added for Gravitimetric Determination
_____ Weight of Carrier Recovered for Gravitimetric Determination
_____ Calculated Gravitimetric Yields

Laboratory Control Samples

_____ Sample Identification
_____ Detector Identification
_____ Date of Analysis
_____ Calculated Recoveries
_____ Results of Analyses
_____ Sample Weight

6.1.E COMPLETENESS CHECKLIST - RADIUM-226 USING SCINTILLATION (LUCAS) CELL COUNTING

Analysis Results

_____ Results Report for Sample Analyses and Reanalyses
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
_____ Calculation Sheets
_____ Sample Identifications
_____ Scintillation (Lucas) Cell Identification
_____ Analysis Date and Analyst Initials
_____ Amounts of Samples Counted
_____ Sample Weight

Initial and Continuing Instrument Calibration

_____ Scintillation (Lucas) Cell Identification
_____ Calibration Dates and Analyst Initials
_____ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
_____ Amount of Standard Used for Calibration
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
_____ Routine Control Charts

Blanks

_____ Scintillation (Lucas) Cell Identification
_____ Date of Analysis
_____ MDA of Method
_____ Amounts of Reagents Used
_____ Lot Numbers of Reagents Used
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)

Duplicates

_____ Scintillation (Lucas) Cell Identification
_____ Date of Analysis
_____ Sample Weight
_____ Amount of Spike for Spiked Duplicates
_____ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric and Gravitimetric Yields

_____ Amount of Spike Used for Spiked Samples
_____ Weight of Carrier Added for Gravitimetric Determination
_____ Weight of Carrier Recovered for Gravitimetric Determination
_____ Calculated Gravitimetric Yields

Laboratory Control Samples

_____ Sample Identification
_____ Scintillation (Lucas) Cell Identification
_____ Date of Analysis
_____ Calculated Recoveries
_____ Results of Analyses

6.1.F COMPLETENESS CHECKLIST - TRITIUM USING LIQUID SCINTILLATION COUNTING

Analysis Results

_____ Results Report for Sample Analyses and Reanalyses
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
_____ Calculation Sheets
_____ Sample Identifications
_____ Instrument Identification
_____ Analysis Date and Analyst Initials
_____ Sample Weight

Initial and Continuing Instrument Calibration

_____ Instrument Identification
_____ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
_____ Amount of Standard Used for Calibration
_____ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
_____ Counting Efficiency Determination Method and Results
_____ Quench Correction Method

Blanks

_____ Instrument Identification
_____ Date of Analysis
_____ MDA of Method
_____ Amounts of Reagents Used
_____ Lot Numbers of Reagents Used
_____ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
_____ Tritium Levels in Background Water

Duplicates

_____ Instrument Identification
_____ Date of Analysis
_____ Amounts of Samples
_____ Amount of Spike for Spiked Duplicates
_____ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

_____ Amount of Tritium Standard Used for Radiometric Yield Determination
_____ Radiometric Yield Calculations and Results

Laboratory Control Samples

_____ Sample Identification
_____ Instrument Identification
_____ Date of Analysis
_____ Calculated Recoveries
_____ Results of Analyses

6.1.G COMPLETENESS CHECKLIST - FLUOROMETRIC ANALYSIS OF URANIUM

Analysis Results

_____ Results Report for Sample Analyses and Reanalyses
_____ Raw Data (Fluorometer Readings, Notebook Pages, etc.)
_____ Calculation Sheets
_____ Sample Identifications
_____ Instrument Identification
_____ Analysis Date and Analyst Initials
_____ Sample Weight

Initial and Continuing Instrument Calibration

_____ Instrument Identification
_____ Calibration Dates and Analyst Initials
_____ Identification of Calibration Standards including Certification, Expiration Date and Concentration Amount of Standards Used for Calibration
_____ Raw Data (Fluorometer Readings, Notebook Pages, etc.)

Blanks

_____ Instrument Identification
_____ Date of Analysis
_____ MDA of Method
_____ Amounts of Reagents Used
_____ Lot Numbers of Reagents Used
_____ Raw Data (Fluorometer Readings, Notebook Pages, etc.)

Duplicates

_____ Instrument Identification
_____ Date of Analysis
_____ Amounts of Samples
_____ Amount of Spike for Spiked Duplicates
_____ Raw Data (Fluorometer Readings, Notebook Pages, etc.)

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Gravitimetric Yields

_____ Weight of Carrier Added for Gravitimetric Determination
_____ Weight of Carrier Recovered for Gravitimetric Determination
_____ Calculated Gravitimetric Yields

Laboratory Control Samples

_____ Sample Identification
_____ Instrument Identification
_____ Date of Analysis
_____ Calculated Recoveries
_____ Results of Analyses

N/A

6.2 HOLDING TIMES

Answer each question with a "Y" for yes, "N" for no, or an "N/A" if the inquiry is not applicable.

Evaluation Criteria and Actions

Samples shall be analyzed within the period of 5 half-lives of the radionuclide of interest or six months, whichever comes first. Samples shall be properly contained and preserved (e.g., acidified) in accordance with laboratory standard procedures, to ensure that sample integrity is maintained.

Holding times for each radionuclide are established by comparing the sampling date on the Chain of Custody form with the dates of analysis found in the data package.

Analysis date - sample date = radionuclide holding time

Have the samples been analyzed within holding time? Yes No N/A

ACTION: If holding time or preservation requirements are not met, qualify all results > LLD as estimated detects (J) and results < LLD as estimated nondetects (UJ). Professional judgement must be used in the case of grossly exceeded holding times. One would expect smaller reported activities as the reviewer may determine that results < LLD are unusable (R).

6.3 CALIBRATION

Instruments must be calibrated in accordance with laboratory standard operating procedures and/or manufacturer's instructions initially and when a detector or other major system component is changed. Frequently thereafter, less extensive continuing calibration checks, which consist of background and check source counts, must be done.

Evaluation Criteria and Actions

a. Initial Calibration

Has the instrument been calibrated within the time period specified in the laboratory standard operating procedure or manufacturer's instructions, but not less than annually?

Yes No N/A

ACTION: If the instrument was not calibrated within the specified time period qualify the associated data as unusable (R). Associated data means, in this case, results for all the analyses for each run or day during the period for which no calibration is valid.

Compare the identifications of detectors calibrated against those used for all analyses to verify that each detector used was calibrated. Has each detector in multiple counting system been calibrated?

Yes No N/A

ACTION: If any detector was not calibrated qualify all associated data as unusable (R).

Review the certifications, including identification numbers, of the standard(s). Compare the identification numbers on the certificates with identification numbers on the instrument printouts. Have NIST, NIST traceable, or equivalent certified standards must be used for calibration?

Yes No N/A

ACTION: If the standards used for calibration are not certified or traceable, or cannot be positively identified, qualify all associated data as unusable (R).

Have the standards been used before their indicated expiration dates?

Yes No N/A

ACTION: If the standards were used past their expiration dates, or past five half-lives of the radionuclide of interest if no expiration date is provided, qualify all associated data as unusable (R).

6.3.A.1 Initial Calibration - Gas Proportional Counters

Evaluation Criteria and Actions

Depending upon the type of counter/system used review the results, as applicable, of the plateau determination, amount of alpha-beta crossover, random coincidence counts, and/or energy calibration. Review the efficiency determinations and self-absorption curves. Is the amount of sample counter within the range of the self-absorption curve?

Is a self-absorption curve present for each radionuclide of interest?

Yes No N/A

Are all efficiencies $\geq$20%?

AB 2/1/93

Yes No N/A

ACTION: If the field and QC sample preparations are outside the range of the self-absorption curves, qualify all associated data as estimated (J). If efficiencies are less than 20 %, qualify all associated data as unusable (R).

6.3.A.2 Continuing Calibration - Gas Proportional Counters

Evaluation Criteria and Actions

Have chi-square or other appropriate statistical tests been performed for the counters on a routine frequency at least weekly)?

Yes No N/A

ACTION: If a chi-square test was not performed, or results of the test show non-random behavior, then qualify all data as estimated (J).

Have stability verifications (e.g., plateau(s) or response(s) to the check sources) been made after each gas change? (Specific verifications may not be needed if check sources are used daily.)

Yes No N/A

ACTION: If stability verifications were not performed qualify all data as estimated (J).

6.3.B.1 Initial Calibration - Alpha Spectroscopy

Evaluation Criteria and Actions

Does calibration of the detector system cover the energy range of interest (i.e., are the radionuclides (peaks) used for calibration identical to and/or bound the energy range of the radionuclides of interest)?

Yes No N/A

ACTION: If the energy of the alpha particle(s) of the radionuclide(s) of interest falls outside the calibrated range of the detector, qualify all results as unusable (R).

Review the calibration spectrum or printout to verify that the resolution of the detector system provides accurate identification of each peak centroid. Do the peaks have sufficient counts?

Yes No N/A

Are the peaks separate and distinct from each other?

Yes No N/A

ACTION: If the centroids of the peaks used for calibration can not be determined from the spectrum or printout qualify all results as unusable (R).

Are FWHM values $\leq$20 KeV?

Yes No N/A

ACTION: If the resolution of the system is greater than 20 KeV (or corresponding number of number of channels) FWHM for any of the peaks used for calibration, qualify all results as estimated (J).

6.3.B.2 Continuing Calibration - Alpha Spectroscopy

Evaluation Criteria and Actions

Compare the efficiency obtained from the calibration to the efficiency obtained from the check source count(s) for the SDG. Are the efficiencies within 5%?

Yes No N/A

Compare the efficiency from the check source count for the SDG with the control charts. Are efficiencies within the control limits or 3 sigma?

Yes No N/A

Has the check source(s) been counted daily or as specified in the Appendices?

Yes No N/A

ACTION: If the daily check source is not performed qualify all associated results as unusable (R).

Review the result, including raw data, of all daily check source counts. Are the check source counts within the control limits provided by the laboratory, or within 3 standard deviations of the mean?

Yes No N/A

ACTION: If the check source counts are outside of the control limits, qualify all associated data as unusable (R). Associated data means here all the results for all the counts within the time period covered by the out of control counts. Use the raw data, or compare the raw data with the count log, to determine the affected time periods. Note any bias or trend in the data validation report.

Review the instrument printouts and counting logs to verify that the background counts were taken on the correct frequency. Have background counts been performed at least weekly and before and after all the field and QC samples in the SDG were taken?

Yes No N/A

ACTION: If the background counts were not performed qualify all associated results as unusable (R).

Are the background counts within control limits provided by the laboratory or within 3 standard deviations of the mean?

Yes No N/A

ACTION: If the background counts are outside of the control limits, qualify all associated data as unusable (R). Associated data means here all the results for all the field and QC samples counted within the time period during which the background counts were out of control. Use the raw data, or compare the raw data with the count log to determine the affected time periods. Note any bias or trend in the data validation report.

ACTION: If the check source efficiency is not within the limits, qualify all associated results as unusable (R).

6.3.C Calibration - Gamma Spectroscopy

Evaluation Criteria and Actions

Review the efficiency calibration curve and/or raw data.

ACTION: If the efficiency calibration does not approximate a smooth semi-log curve, then qualify all results as unusable (R).

Verify that geometry and matrix factors were accounted for in the analyses of all field and QC samples.

ACTION: If geometry and matrix factors are not used qualify all results as unusable (R).

The calibration of the detector system must cover the energy range of interest, but at least 0 to 2 MeV. Review the energy calibration and verify that the radionuclides (peaks) used for calibration are within and/or bound the energy range of the radionuclides of interest.

ACTION: If the energy of the radionuclides falls outside the calibrated range of the detector, qualify all results as unusable (R).

Review the calibration data to verify that the resolution of the detector system is sufficient for the radionuclides of interest, i.e., that accurate identification of peak centroid can be made, and the peaks are distinct and separate from each other. A nominal value of 5 channels FWHM is used to gauge resolution.

ACTION: If the resolution of the system is greater than 5 channels FWHM for any of the peaks used for calibration, qualify all results as estimated (J).

b. Continuing Calibration

Has the check source been identified by activity and radionuclide(s)?

Yes No N/A

ACTION: If the activity and identity of the radionuclide(s) used in the check source(s) are not provided qualify all associated data as estimated (J).

6.4 BLANKS

Evaluation Criteria and Actions

A reagent (or method) blank of the same aliquot size as the samples must be processed like a sample and analyzed with each SDG on the same detectors or detector system, or a field blank must be analyzed with each SDG on the same detectors or detector system, or both. Has at least one blank been analyzed with the SDG?

Yes No N/A

ACTION: If no blanks were analyzed with the SDG, or if the blanks were not analyzed on the same detectors or detector system, qualify all the results > LLD as estimated (J).

The net blank value, i.e., the results from the analysis of the blank corrected for background, should be less than the minimum detectable activity (MDA), which is the minimum quantity of radioactive material that can be detected in the sample at the 95% confidence level. Have contaminants been detected in the blanks?

Yes No N/A

ACTION: If contaminants are detected in any blank, associated sample results that are reported as statistically greater than background but < the minimum detectable activity (MDA), are qualified as nondetects (U). Any other sample result is qualified as an estimated detect (J) unless the sample result is 10 times the contaminant in the blank. Generally, no action is taken for radionuclides detected in a blank but not in a sample, although the validator must be vigilant for situations when a radionuclide in a blank but not in a sample may cause interference with other radionuclides of interest in the sample. Verify calculation or method of calculating the net blank value. Any blank with a negative result whose absolute value is > LLD must be carefully evaluated to determine its effect on sample data. Review all the QC data specific to the method to evaluate the possibility of false negatives.

6.5 DETECTION LIMITS AND SAMPLE RESULTS

Verify calculation or method of calculating the Lower Limit of Detection and the Minimum Detectable Activity. Methods must be equivalent to the following:

$$LLD = (4.66)\ (\text{Background Counts})^{1/2}$$

$$MDA = \frac{(4.66)\ (\text{Background Counts})^{1/2}}{(\text{Efficiency})\ (\text{Volume})\ (\text{Yield})\ (\text{Conversion Factors})}$$

Verify that all positive results (detects or results not qualified with a U) reported meet the detection limits stated in the SOW and are above the MDA for the analysis or method.

Can the detection limits (LLD and MDA) be verified? Yes No N/A

Verify the calculation of sample results by examining the raw data, i.e., spectra or printouts, for counts, counting time, efficiencies, and yields or recoveries, and data transcriptions, e.g., sample volumes.

ACTION: Correct any errors on the photocopied pages of the data package and include in the data validation report. Qualify all results for which the MDA and LLD calculations cannot be verified as estimated detects (J) or estimated nondetects (UJ).

6.6 RADIOMETRIC AND GRAVIMETRIC YIELDS

Evaluation Criteria and Actions

Has at least one spike, tracer, or chemical yield been analyzed in each SDG?
Yes No N/A

ACTION: If no or an inappropriate spike, tracer, or carrier was used qualify all associated results as unusable (R).

Samples identified as field blanks may not be used for spike, tracer, or chemical yield analysis. Look as chain-of-custody documents to find identifier. Has field blank been used for chemical yield analyses?
Yes No N/A

ACTION: If the field blank was used for spike, tracer, or chemical yield analysis, all other QC data must be carefully checked and professional judgement used when evaluating the data. Document if the field blank was used but don't qualify data on this alone.

Spike or tracer per cent recovery, or chemical yield must be within the control limits of 30-105 % for all radionuclides or as specified in the Appendices. If sample activity is > 4x the spike activity, recovery limits do not apply. Review the raw data for counts, activity, and aliquot of the tracer, spike, or carrier used. Have the per cent recoveries or yields been correctly calculated and reported?
Yes No N/A

Are percent recoveries within specified limits?
Yes No N/A

ACTION: Qualify associated sample results outside of the acceptable limits as estimated detects (J), estimated nondetects (UJ), or unusable (R) according to the following guidelines. Note any bias or trend in estimated results in the data validation report.

Yield (%R):	<30%	30-105%	>105%	>115%
Results < LLD:	R	acceptable	UJ	R
Results > LLD:	R	acceptable	J	R

6.6.A Radiometric Yields - Alpha Spectroscopy

Evaluation Criteria and Actions

Has tracer been used to spike each sample prior to analysis?

Yes No N/A

ACTION: If a sample did not have a tracer added, qualify the result as unusable (R).

The percent recovery of the tracer should be between 30 % and 105 %. Verify that the recovery is calculated from the applicable instrument efficiency. Check the calculation of recovery using the following formula:

% recovery = (net CPM tracer/DPM tracer added) (efficiency in DPM/CPM) (100)

Are percent recoveries within specification?

Yes No N/A

ACTION: Qualify results outside of the acceptable limits as estimated (J or UJ), or unusable (R) according to the following guidelines. Note any bias or trend in estimated results in the data validation report.

Yield (%R):	<30%	30-105%	>105%	>115%
Results < LLD:	R	acceptable	UJ	R
Results > LLD:	R	acceptable	J	R

6.7 DUPLICATE SAMPLES AND ANALYSES

Evaluation Criteria and Actions

Has at least one duplicate processing and analysis been performed for every ten samples in the SDG?

Yes No N/A

ACTION: If the number of duplicate analyses is not satisfactory then qualify all associated results as estimated (J).

Have samples identified as field blanks (look at chain-of-custody documents) been used for duplicate sample analysis?

Yes No N/A

ACTION: If the field blank was used for duplicate analysis, all other QC data must be carefully checked and professional judgement exercised when evaluating the data. Document if the field blank was used but don't qualify data on this alone.

Relative Percent Difference (RPD) between the sample and duplicate analysis of samples must be within the control limits of $\pm$ 35% for results > 5x the LLD). A control limit of $\pm$ 2x the LLD is applied if one or both of the sample values are < 5x the LLD. If both values are < LLD, no control limit is applicable. Review the data package and verify that results have been correctly calculated and reported and fall within the established control limits.

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

S = first sample value (original)

D = second sample value (duplicate)

Are all RPD values within specification?

Yes No N/A

ACTION: If duplicate analysis results for a particular radionuclide are outside the specified control limits, qualify results < LLD as estimated nondetects (UJ), and results > LLD as estimated detects (J) for that radionuclide in all samples of the SDG.

6.8 LABORATORY CONTROL SAMPLE (LCS)

Laboratory Control Samples may be prepared by the same laboratory performing the analyses or by a reference laboratory or agency. Laboratory control samples are equivalent to internal or external control samples. Laboratory Control Samples, or their equivalents, may be identified as QC samples, as samples from a particular agency, or as LCS.

Evaluation Criteria and Actions

All LCS results must be within the control limits. If control limits are not provided by the laboratory then use the control limits of 80-120 %R.

$$\text{LCS \%R} = \frac{\text{LCS found}}{\text{LCS true}} \times 100$$

LCS found = concentration or activity for each radionuclide measured in the LCS

LCS true = concentration or activity of each radionuclide in the LCS

Have all LCS results been correctly calculated? Yes No N/A

Are all LCS results within established control limits? Yes No N/A

ACTION: Qualify affected sample results as estimated detects (J), estimated nondetects (UJ), or unusable (R) for radionuclides that are outside control limits according to the following guidelines. Affected sample results may be all results for the SDG or just the results following an out-of-control LCS.

Radionuclide %R	<50%	50-79%	>120%
Results < LLD:	R	UJ	R
Results > LLD:	R	J	R

Note any bias or trend in estimated results.

Has at least one LCS been analyzed with the SDG? Yes No N/A

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ACTION: If the required LCS are not analyzed, qualify all results as estimated (J).

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6.9 SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?

Yes No N/A

Were project-specific data quality objectives met for this analysis?

Yes No N/A

APPENDIX 3
Requirements for Tritium Liquid Scintillation Analyses

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

3.1 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

Most automated liquid scintillation systems are capable of processing many more samples than is normally contained in an SDG. As a minimum, one calibration standard should be included with every analytical run of samples. An analytical run can be comprised of more than one SDG.

- If sample data lacks calibration standards qualify all associated results as unusable. (R).

The efficiency for detecting the tritium beta particle must be established for each counting system. The counting system is comprised of the liquid scintillation counter, scintillation solution, and sample matrix. The laboratory should provide detailed explanation of the method and results for determining the counting system efficiency. For automated systems employing computerized algorithms, copies of applicable pages from the instrument manuals should be submitted with the analytical results.

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- If the method and results for counting efficiency determination are not provided, qualify all associated results as unusable, (R).

3.2 Blanks

Tritium in chemical reagents or water used for background determinations will interfere with sample results and reduce the method sensitivity. Tritium levels in reagents and background water should be less than the desired MDA for the method.

- If the tritium levels in reagents or background water exceed the desired MDA, qualify associated results less than 10X the background tritium level as estimated, (J).

- If blank samples are not analyzed to check potential contamination in each lot of chemical reagents, qualify associated results estimated, (J).\

3.3 References

1. U.S. Environmental Protection Agency, "Tritium in Drinking Water," in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

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APPENDIX 1
General Requirements for the Analysis of Alpha Emitting Radium Isotopes Using Liquid Scintillation

Scope

This Appendix provides additional criteria for validating analytical results from the determination of total soluble alpha emitting radioisotopes of radium (radium-223, radium-224 and radium-226) in water. The radium is collected by coprecipitation with a carrier and counted with an alpha scintillation counter. This method tends to overestimate specific isotope results (i.e., radium-226) when other alpha emitting species are present. The method is useful as a screening technique for determining the need for isotopic analysis.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the procedure and the appendix, the criteria in the appendix shall apply.

1.1 Analytical Method

Specificity

The method is not specific for any given isotope of radium. Results will represent the activity of all soluble alpha-emitting radium isotopes present in the sample.

- Qualify all results attributed to a single radium isotope (specifically, Ra-223, Ra-224, or Ra-226) as estimated, (J), if the contribution to the total from individual isotopes is unknown.

Accuracy

Decay of Ra-226 present in samples will result in daughter products whose activity could lead to inaccurate results. The impact of the daughter ingrowth on the sample results is directly proportional to the elapsed time between the precipitation of the chemical carrier and counting the sample. The laboratory should provide evidence that: 1) Elapsed time from precipitation to counting is sufficiently short that daughter ingrowth effects are negligible, or 2) Sample results have been corrected for daughter ingrowth effects. Table 1-1 shows the factors to be divided into sample results to correct for Ra-226 daughter ingrowth.

Review the data package to insure that the times of sample precipitation and counting have been accurately recorded to allow determination of daughter ingrowth.

- If the time from sample precipitation to counting cannot be verified, qualify all associated results greater than the MDA as estimated, (J).

Interferences

Samples with greater than 0.2 mg barium content may cause a falsely high chemical yield, resulting in erroneously low sample results. If the potential exists for elevated barium levels in samples, actions must be identified that will either eliminate or correct erroneous sample results.

- If the laboratory has not taken steps to correct results for samples with potential elevated barium levels, qualify results as estimated, (J).

1.2 Counting Efficiency

The detector counting efficiency for Ra-226 in the sample matrix should be established with the analysis of each SDG. This can be accomplished by carrying two to three internal Ra-226 standards through the analysis procedure with each SDG.

- If the counting efficiency is not determined with each SDG, qualify all associated results unusable, (R).

1.3 Blanks

Most chemical reagents typically used in this procedure contain some levels of radium. It is prudent to analyze additional blank samples in the event that the batch or lot number of a reagent should change in the course of preparing a group of samples for analysis.

- If blank samples are not analyzed to check potential contamination in each lot number of chemical of reagents qualify associated results as estimated, (J).

1.4 Laboratory Control Samples

This method will not be able to achieve the criteria for accuracy specified in Section 6.8. Accuracy is determined by comparing the analytical results from laboratory control samples with the known concentration of radium isotopes. The

two values are used to compute a recovery factor (LCS %R presented in Section 6.8).

- Qualify associated sample results according to the following criteria:

Method Accuracy Criteria

LCS %R

	<50%	50-69%	70-130%	>130%
Results <MDA	R	UJ	Acceptable	R
Results >MDA	R	J	Acceptable	R

1.5 Holding Times

Samples are to be presented by adjusting the pH < 2 with Nitric Acid. The following holding time requirements apply according to the time of preservation:

a. If the sample is preserved at the time of collection, Section 6.9 requirements apply.

b. If the sample is not preserved at the time of collection, these requirements are substituted for those in Section 6.9:

- Time from sampling to receipt at laboratory cannot exceed 5 days.
- Laboratory must preserve the sample upon receipt and hold for at least 16 days prior to analysis.

- Qualify associated sample results estimated, (J), if holding time requirements are not met.

1.6 References

1. U.S. Environmental Protection Agency, "Alpha Emitting Radioisotopes," in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

2. ASTM, "Standard Test Method for Radionuclides of Radium in Water," in 1991 Annual Book of ASTM Standards, Volume 11.02, 1990.

3. U.S. Department of Energy Environmental Measurements Laboratory, "Radiochemical Determination of Radium-226," in EML Procedures Manual, HASL-300-Ed.25, 1982.

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Table 1-1: Correction Factors for Ra-226 Daughter Ingrowth

Time (From Precip. to Counting, Hrs.)	Ingrowth Correction Factor
0	1.00
1	1.02
2	1.04
3	1.06
4	1.08
5	1.10
6	1.12
24	1.49
48	1.91
72	2.25
96	2.54
120	2.78
144	2.99
192	3.29
240	3.51

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APPENDIX 2
General Requirements for Lucas Cell Ra-226 Analyses

Scope

This Appendix provides supplemental information for validating analytical results from the determination of radium-226 in water. The radium-226 is separated from interfering species and concentrated by coprecipitation. After allowing for the ingrowth of radon-222, the radon is purged and counted in a scintillation (Lucas) cell.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the procedure and the appendix, the criteria in the appendix shall apply.

2.1 Calibration

A counting system consists of a scintillation cell and associated photomultiplier tube, electronics and scaler. Each counting system should be calibrated as a unit. Calibration consists of determining a calibration constant using a NIST traceable Ra-226 standard. The calibration constant includes the de-emanation efficiency of that system and the counting efficiency of the scintillation cell. The calibration constant should be established for a system at the beginning of each day that samples will be analyzed and each time the scintillation cell is replaced. The scintillation cell should be uniquely identified to allow its association with a specific counting system to be identified.

- If calibration data cannot be definitely associated with the specific counting system, qualify associated sample results unusable, (R).
- If the counting system is not calibrated each day that samples are analyzed, qualify associated results as estimated, (J).
- If the counting system is not calibrated upon replacing the scintillation cell, qualify associated results estimated, (J), if the cell has a previously determined calibration constant, or unusable, (R), if no constant is available for the replacement cell.

2.2 Blanks

Most chemical reagents typically used in this procedure contain some levels of radium. It is prudent to analyze additional blank samples in the event that the batch or lot number of a reagent should change in the course of preparing a group of samples for analysis.

- If blank samples are not analyzed to check potential contamination in each lot of chemical reagents qualify associated results estimated, (J).

2.3 Holding Times

Samples are to be preserved by adjusting the pH < 2 with Nitric Acid. The following holding time requirements apply according to the time of preservation:

a. If the sample is preserved at the time of collection, Section 6.9 requirements apply.

b. If the sample is <u>not</u> preserved at the time of collection, requirements are substituted for those in Section 6.9.

   - Time from sampling to receipt at laboratory should not exceed 5 days.
   - The laboratory <u>must</u> preserve the sample upon receipt and hold for at least 16 days prior to analysis.

- Qualify associated sample results estimated, (J), if holding time requirements are not met.

2.4 References

1. U.S. Environmental Protection Agency, "Radium-226 in Drinking Water, Radon Emanation Technique," in <u>Prescribed Procedures for Measurement of Radioactivity in Drinking Water</u>, EPA-600/4-80-032, August 1980.

2. ASTM, "Standard Test Method for Radium-226 in Water," in <u>1991 Annual Book of ASTM Standards</u>, Volume 11.02, 1990.

3. U.S. Department of Energy Environmental Measurements Laboratory, "Emanation Procedure for Radium-226," in <u>EML Procedures Manual</u>, HASL-300-Ed.25, 1982.

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APPENDIX 4
Requirements for Fluorometric Analyses of Uranium

Scope

This Appendix provides supplemental information for validating analytical data from the determination of uranium by fluorometry. The uranium is separated from interferences and concentrated by coprecipitation and purified by solvent extraction. The sample is fused with flux and analyzed with a fluorometer.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the procedure and the appendix, the criteria in the appendix shall apply.

4.1 Analytical Method

Interferences

The fluorescence of uranium in the fluoride matrix can be either quenched or enhanced by the presence of cations or anions. When uranium is present in low concentrations, the interferences can be removed by various methods.

- The analytical laboratory should provide evidence that interference from cations or anions is negligible, or that steps have been taken to minimize their effects. If evidence is not provided, qualify associated results as estimated, (J).

Method Standardization

The fusion operation is the most critical step in the fluorometric procedure. Small variations in the duration of the fusion.temperature of the fusion, and in the method of cooling the fused disk can cause large variations in the fluorescence yield. Each step of the fusion process should be standardized to obtain reproducible results.

- The analytical laboratory should provide a description of the method for fusion standardization. If the fusion process is not standardized, or information is not provided to allow the independent assessment of the standardization process, qualify associated results as estimated, (J).

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4.2 Calibration

In addition to the internal standard added to each sample, a calibration should be performed immediately prior to sample analysis to confirm the linear relationship between the fluorometer readings and uranium concentrations.

- If a calibration is not performed immediately prior to sample analysis to verify linear instrument response, qualify associated results estimated, (J).

4.3 References

1. U.S. Environmental Protection Agency, "Uranium in Drinking Water - Fluorometric Method," in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.

2. ASTM, "Standard Test Method for Microquantities of Uranium in Water by Fluorometry," in 1991 Annual Book of ASTM Standards, Volume 11.02, 1990.

3. U.S. Department of Energy Environmental Measurements Laboratory, "Fluorometric Determination of Uranium in Urine," in EML Procedures Manual, HASL-300-Ed.25, 1982.