START 9613503.0386

BOBKJ7-TMA-144

TMA

0045604

JUN 1994
RECEIVED
SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY AND ORGANICS
Case No. 04-035
(TMA/ARLI W.O. No. A4-04-035)

NITRATE/NITRITE
Case No. N4-04-042
(TMA/Skinner & Sherman W.O. No. S4-04-123)

June 6, 1994

OCT 1996
RECEIVED
EDMC

TMA Master Work Order N4-04-042

9613503.0387

000002

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-04-042
RCVD: 04/13/94 DUE: 05/18/94 04/13/94 14:17:05 KEEP: 05/18/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01A-W	BOBKJ7		ARLI	WH018	WH019	WH043
01C-W	BOBKJ7	MS	ARLI	WH018	WH019	WH043
01D-W	BOBKJ7	MSD	ARLI	WH018	WH019	
01E	BOBKJ7	DUP	ARLI	WH043		
02A-W	BOBKJ8		ARLI	WH018		

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Tyamamoto	4/13/94	ARLI	4/13/94	DS	4/14/94

9613503.0388

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Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 200-UP-1

Collection Date 04/8/94

Ice Chest No. #4

Field Logbook No. EFL-1124

Bill of Lading/Airbill No. 1402137385

Offsite Property No. W99-0-0336-3

Method of Shipment EMERY

Shipped to ~~TT~~ TMA KT 3/25/94

Possible Sample Hazards/Remarks NONE DETECTED

Sample Identification

BOBK J7

✓✓✓3; 40mL; Gs; WATER; VOA (HCl)

✓✓✓ 3; 1L; aG; WATER; PCB/PEST

✓1; 500mL; G; WATER; ANIONS (IC)-NO3

✓ 1; 500mL; P; WATER; NO3 (H2SO4)

✓✓ 2; 4L; P; WATER; TOTAL URANIUM, U-234/235/238, GROSS ALPHA/BETA, Sr-90 (HNO3)

✓ 1; 1L; P; WATER; Tc-99 (HCl)

BOBK J8

✓✓✓ 3; 40mL; Gs; WATER; VOA (HCl)

[] Field Transfer of Custody

Chain of Possession- (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
B. WHITTEN	4/8/94	1130	L Sweeney L Sweeney	4-8-94	1130
L Sweeney L Sweeney	4-12-94	1000	Kermit Blum K. Blum	4-13-94	1200

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

Data Deliverable-Standalone samples stored in frig. A3A by K.D. Lee 04/08/94

A-6000-407 (12/92) WEF061

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Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. D. Lee Date Sampled 04/8/94 Time 0911 hours

Company Contact P. H. Butcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
BOBK	3; 40mL; Gs	WATER	VOA (HCl)
	3; 1L; aG	WATER	PCB/PEST
	1; 500mL; G	WATER	ANIONS (IC)-NO3
	1; 500mL; P	WATER	NO3 (H2SO4)
	2; 4L; P	WATER	TOTAL U, U-234/235/238, GROSS ALPHA/BETA,
			Sr-90 (HNO3)
	1; 1L; P	WATER	Tc-99 (HCl)
BOBK	3; 40mL; P	WATER	VOA (HCl)
			OPC: W94-0-0336-32
			BOL: 1402137385
			SAF: 94-088

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406(05/90)

000003

FEDERAL EXPRESS

USE THIS AIRBILL FOR SHIPMENTS WITHIN THE CONTINENTAL U.S.A., ALASKA AND HAWAII.
USE THE INTERNATIONAL AIR WAYBILL FOR SHIPMENTS TO PUERTO RICO AND ALL NON U.S. LOCATIONS.
QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE TRACKING NUMBER 8826001612

3356M 8826001612

RECIPIENT'S COPY

1 Date 4-13-94

From (Your Name) Please Print: SAMPLE CONTROL
Your Phone Number (Very Important): (510)235-2633
Company: M A /NORCAL
Department/Floor No.:
Street Address: 2030 WRIGHT AVE
City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: CAROLE HARRIS
Recipient's Phone Number (Very Important): (818)357-3047
Company: TMA/ARLI
Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 TAYLOR STREET
City: MONROVIA State: CA. ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
7340-6406

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here
Street Address
City State ZIP Required

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

4 SERVICES (Check only one box)

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

Standard Overnight (Delivery by next business afternoon. Select for Saturday delivery.)
51 [ ] OTHER PACKAGING
58 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

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

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

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

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
1 [ ] HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 [X] DELIVER WEEKDAY

Saturday Service
31 [ ] HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
9 [ ] SATURDAY PICK-UP (Extra charge)

Special Handling
4 [ ] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845 ____ x ____ kg. 904 III
[ ] DESCRIPTION
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6 PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
Total 1	Total 42	Total

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

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

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

7 Release Signature:

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

REVISION DATE 12/92
PART #137204 FXEM 11/93
FORMAT #158
158
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BEST AVAILABLE COPY

9613503.0391

000001

SAMPLE LOG-IN SHEET WAC

LAB NAME : TMA/ARLI

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): RAYAM SHADI

LOG-IN-DATE : 4/14/94

RECEIVED BY (SIGNATURE): Rayam Shadi

ICE CHEST NO. SML536

REMARKS:

1. Custody Seal(s) Present / Absent* Intact / Broken
2. Custody Seal Nos: 8826001612
3. Chain of Custody Records Present / Absent*
4. Traffic Reports or Packing List Present / Absent*
5. Airbill Airbill / Sticker Present / Absent*
6. Airbill No.: N/A
7. Sample Tags Present / Absent*
8. Sample Tag Numbers Listed / Not Listed on Chain of Custody
9. Sample Condition: Intact / Broken* / Leaking
10. Does information on custody records, traffic reports, and sample tags agree? Yes / No*
11. Date Recieved at Lab: 4/14/94
12. Temp of ice chest 5 °C
13. Time Recieved: 9:30 AM

SAMPLE TRANSFER

Fraction: N/A

Area #: N/A

By: N/A

On: N/A

EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
	BOBK57	A4-03-035	good
	BOBK58		

Contact SMO and attach record of resolution

Reviewed By:

Date:

Logbook No.: N/A

Logbook Page No.: N/A

FORM DC-1

9613503.0392

000005

TMA/ARU
Thermo Analytical Inc.

RADIATION DOSE RATE SURVEY FORM

Date 4/14/94 COMPANY TMA/NORCAL OTHER ORD # 8826001612

Surveyor's Name MARK S. McCray

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

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

Calibration Date 11/17/94 Calibration Date 3/15/94

Instrument Calibration Factor 0.217 Instrument Calibration Factor 0.188

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		27.0			1.0				
Consistency		7,220	0.2787		5,000	0.1838			
Smears: SML-536		93.0			14.0			None	
Reported WHC: (6) samples each <50pCi/gram									

Comments: VICTOREEN 450 P Shown 15 μR/h MSM 4/14/94

All OK ✓ Approved MSM

Not OK Date 4/14/94

FORM SOP-075.1

"quality environmental services"

GENERAL CHEMISTRY RESULTS

CASE NO. 04-035

Sample #s:

B0BKJ7 B0BKJ8

CASE NARRATIVE

Sample B0BKJ7 (A4-04-035-01G) yielded a 22.2% RPD for the Fluoride analysis. The results are considered valid based on the very low concentration relative to the difference between the sample and duplicate.

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

Maureen Parrish 6/3/94

Maureen Parrish

9613503.0394

000009

TMA Inc. REPORT Work Order # A4-04-035

Received: 04/13/94

Results by Sample

SAMPLE ID B0BKJ7 FRACTION 01B TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 04/08/94 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	11.9	mg/L	0.8
Fluoride	300.0	0.4	mg/L	0.1
Phosphate	300.0	<0.4	mg/L	0.4
Sulfate	300.0	29	mg/L	1
Nitrate Nitrogen	300.0	5.9	mg/L	0.2
Nitrite Nitrogen	300.0	<0.1	mg/L	0.1

FORM I

000077

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 04-035

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : April 13, 1994

1.0 DESCRIPTION OF CASE :

Two water samples were analyzed for TCL Organics- Volatiles and Pesticides/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	pH
B0BKJ7	A4-04-035-01A	V	WATER	0
B0BKJ7	A4-04-035-01B	P	WATER	
B0BKJ7 MS	A4-04-035-01C	P	WATER	
B0BKJ7 MSD	A4-04-035-01D	P	WATER	
B0BKJ8	A4-04-035-02A	V	WATER	0
B0BKJ8 MS	A4-04-035-02B	V	WATER	0
B0BKJ8 MSD	A4-04-035-02C	V	WATER	0

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received unbroken and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL WATER :

The samples were analyzed within the CLP SOW holding times.

The TCL analyte, Carbon Tetrachloride, was detected in sample B0BKJ7, at a relatively high concentration.

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

TUNES :

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

000078

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 04/20/94 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by single injection into a dual column system.

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

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

SAMPLE NOTES :

LOW LEVEL WATER :

The samples were extracted and analyzed within the CLP SOW holding times. The TCX and DCB surrogate recoveries in all of the samples were within the advisory QC limits. No TCL analytes were detected in the samples.

Both the MS and MSD samples were inadvertently spiked with the multiresponse analyte, Aroclor-1254, instead of the Pesticide spiking analytes. Therefore, the matrix spike summary form exhibits no recoveries for the Pesticide spiking compounds. Since there was a limited sample volume, a reextraction for the matrix spike samples was not feasible, and the Aroclor-1254 spiking recoveries were reported. The MS and MSD samples were spiked with 2.0 ug/L of Aroclor-1254, with an 85% recovery in the MS, and a 80% recovery in the MSD sample.

All of the QC results were within the limits specified by 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 6/6/94
Nicole Roth
CLP Program Manager

Maureen Parrish 6/3/94
Maureen Parrish
Program Manager

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKJ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R03

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	20	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	3	J
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	170	
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BKJ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R03

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613503.0399

000081
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B0BKJ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R04

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9613503.0400

000082

EPA SAMPLE NO.

B0BKJ8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R04

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKJ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-01B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: 04/13/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 04/14/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/21/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-36-3	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9613503.0402

 *** T M A *** REPORT Work Order # S4-04-123

Received: 04/14/94 05/11/94 09:21:04

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

ATTEN Dan Steurmer

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

PREPARED Thermo Analytical, Inc.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N4-04-042
TAKEN By Client
TRANS Fedex
TYPE 1 water
P.O. # N4-04-042
INVOICE under separate cover

SAMPLE IDENTIFICATION		TEST CODES and NAMES used on this workorder	
01	BOBKJ7	NO3NO2	Nitrate/Nitrite
01	BOBKJ7D		
01	BOBKJ7S		
02	LCSW		

JUN 1994 RECEIVED SDLA

RECORD COPY

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

9613503.0403

 *** T M A *** REPORT Work Order # S4-04-123

Received: 04/14/94

Results by Sample

SAMPLE ID B08KJ7 SAMPLE # 01 FRACTIONS: A

Date & Time Collected 04/08/94 Category WATER

NO3NO2 7.92

mg N/L

SAMPLE ID B08KJ7D SAMPLE # 01 FRACTIONS: B

Date & Time Collected 04/08/94 Category WATER

NO3NO2 7.67

mg N/L

SAMPLE ID B08KJ7S SAMPLE # 01 FRACTIONS: C

Date & Time Collected 04/08/94 Category WATER

NO3NO2 16.0

mg N/L

SAMPLE ID LCSW SAMPLE # 02 FRACTIONS: A

Date & Time Collected not specified Category WATER

NO3NO2 2.02

mg N/L

TMA
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Skinner & Sherman Laboratories Inc.

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9613503.0404

 *** T M A *** REPORT Work Order # S4-04-123

Received: 04/14/94 05/11/94 09:21:04

TMA/NORCAL Hanford

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

MATRIX SPIKE

Sample ID	Sample Result	Spike Added	Spike Result	% Recovery
S404123-01	7.92 mg/L	10.0 mg/L	16.0 mg/L	80.8

DUPLICATE

Sample ID	Sample Result	Duplicate Result	Relative % Difference
S404123-01	7.92 mg/L	7.67 mg/L	3.2

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	Percent Recovery
LCS	2.00 mg/L	2.02 mg/L	101.0
Prep blank	--	<0.25 mg/L	--

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

9613503.0405

Received: 04/14/94

Test Methodology

TEST CODE NO3NO2 NAME Nitrate/Nitrite

USEPA Methods for Chemical Analysis of Water and Wastes
(EPA-600/4-79-020), Method 353.2 (modified) -- Colorimetric, Automated
Cadmium Reduction

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

9613503.0406

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 54-04-123 Client Hanford WCH Number/Type of Samples 1 water
Protocol CLP Turnaround 33 days Cooler Temp: 2.3 °C or N/A Cooler Yes/No
Custodian: D. Mauritzen Shipper & # Fedex SDG/Batch# N/A
Custody Seal: Present/Absent/Intact/Not Client Case# N4-04-0412
Purchase Order/Contract# N4-04-042 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 4/14/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BABK07	water	4/14/94	3.02	NO3/NO2	28 - [illegible]
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Complete
VRW 4/14/94

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

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

Page: 12

033

9613503.0407

PAGE: [illegible] CHAIN OF CUSTODY CHD # NA-04-042

SCHD: [illegible] [illegible] KEEP: 05/18/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY
01B-W	B03KJ7		S&S	WH137
01F-W	B03KJ7	MS	S&S	WH137
01G-W	B03KJ7	DUP	S&S	WH137
01H-W	L C S		S&S	WH137

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yyamamoto	4/13/94	S/Cinner	4/13/94	D. Martineau	4/14/94

BEST AVAILABLE COPY

9613503.0408

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

MAY 1994
RECEIVED
SDLA

May 20, 1994

Ref: TMA/Norcal N4-04-044-7361

RECORD COPY

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

Dear Ms. Colley:

Enclosed is the data report for one water sample designated as SAF# 94-088, received April 13, 1994. Results are given for gross alpha, gross beta, strontium-90, technetium-99, uranium-233, 234/235, and 238, and total uranium.

The data package is paginated 1 through 198.

Please call if you have any questions concerning this data.

Sincerely,

N. Joseph Verville

N. Joseph Verville
Nuclear Program Manager
TMA/Norcal

NJV/ss

Enclosure: Data Package

1

TMA/Norcal

Report N4-04-044-7361
Sample Delivery Group 7361

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

Case Narrative

May 20, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7361 is comprised of one water sample designated as SAF #94-088, delivered under Field Logbook No. EFL-1124. Unique identifiers were not listed on the Chain-of-Custody documents. Two 4 L poly bottles containing the sample was received for analysis.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

The gross alpha recovery for the LCS was 75% which is outside the Hanford data validation guidelines of 80-120% but within the 3σ total protocol limits of 74-126%.

2.2 Gross Beta Analyses

The gross beta recovery for the LCS was 79%, just outside both the Hanford data validation guidelines and the 3σ total protocol limits of 80-120%. Since the result for the reagent blank was negative, and the result of the duplicate analysis was a very good match to the result of the original analysis the samples were not realiquoted.

2.3 Strontium-90 analyses

No problems were encountered by the laboratory with the analyses.

2.4 Technetium-99 Analyses

No problems were encountered by the laboratory with the analyses.

2.5 Uranium-233, 234/235, and 238 Analyses

Due to high uranium activity, sample B0BKJ7 and the duplicate of sample B0BKJ7 were counted on a low efficiency detector for better peak resolution. As a result the low counter efficiency caused the MDA's to increase above the RDL. The higher MDA's are not a problem since the activity of the samples is so much greater than the RDL. The MDA's for uranium-233/234, and 238 in the lab control sample were greater than the RDL, however the activity of the lab control sample is so much greater than the RDL that the high MDA is not considered a problem. The reagent blank contained uranium activity but at such a low level relative to the sample activity that the quality of the analyses is not compromised.

2.6 Total Uranium Analyses

The MDA's for sample B0BKJ7, the duplicate of sample B0BKJ7, and the laboratory control sample were greater than the RDL due to dilutions performed on the samples in order to achieve a response from the laser phosphorimeter (KPA) within the calibration range. Sample B0BKJ7 contained uranium at a level much greater than the RDL therefore the high MDA is not considered a problem.

9613503.0411

TMA NORCAL

SAMPLE DELIVERY GROUP 7361

N404044-01

DATA SHEET

B0BKJ7

Case/SDG 94-088/7361 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N404044-01 Client sample id B0BKJ7
Dept sample id 7361-001 Location/Matrix 200-UP-1 LIQUID
Received 04/13/94 Collected 04/08/94
Chain of custody id EFL-1124

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	Alpha	350	14	2	3		80A
Gross Beta	Beta	180	5.5	2	4		80B
Strontium 90	10098-97-2	0.21	1.2	0.7	2	U	Y
Technetium 99	14133-76-7	29	1.8	2	5		TC
Uranium 233/234		180	27	0.9	0.2		U
Uranium 235	15117-96-1	14	2.3	0.2	0.2		U
Uranium 238		180	27	0.8	0.2		U
Total Uranium (ug/L)	7440-61-1	610	120	4	0.1		U_T

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/20/94

9613503.0412

92

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

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

E Shipper's Account Number

EMERY WORLDWIDE — A CF Company

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

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐

Date	Origin	Shipment Number
4-12-94	PSC	1402137386

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O

To:
TMA/NORCAL
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA USA

Tariff Dest.

Check to Shipper $

Hold for Pick Up ☐

Canada ☐

EMERY WORL will accept Co nee's check w risks being as by Shipper, in but not limited non-payment. and misrepres

Customer's Reference Numbers: W81232 PT1FA W94-0-0336#32

E Consignee's Account Number: 94804

PH BUTCHER

Description	Pcs.	L	W	H	Total Pieces	Total Weight (in Lbs.)
1 COOLER ID: #4 WATER SAMPLES	1	21	16	16	1	76

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

Declared $

1402137385

Remarks: OVERNIGHT DELIVERY SIGNATURE SECURITY SERVICE

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Mark if Emery Packaging is used: Urgent Letter 9X12 ☒ Urgent Pak 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-1

Terms and Conditions on Back

OCC 43

9613503.0413

VALIDATION SUMMARY

9613503.0414

Los Alamos Technical Associates, Inc.

8633 Gage Blvd. / Kennewick, WA 99336 / Telephone (509) 783-4369 / FAX (509) 783-9661

August 1, 1994

AUG 1994 RECEIVED 700

Karl Pool
Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

Dear Karl,

Attached is the data validation report for analytical results for 200-UP-1 (SDG B0BKJ7-TMA-744). The package was received by Los Alamos Technical Associates on June 17, 1994. Validation of this package began on July 13, and was completed on August 1, 1994.

If you have any questions, please let me know.

Sincerely,

Donald J. Smith
Senior Environmental Engineer

cc: Chris Haecker, LATA
VW401.75 file

RECEIVED
AUG 2 1994
VALIDATION DOCUMENTATION
SDLA

9613503.0415

DATA VALIDATION REPORT
for
200-UP-1
SDG BOBKJ7-TMA-744
LATA VW401.75

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

August 1, 1994

000000

9613503.0416

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- ANALYSES REQUESTED 2
- DATA QUALITY OBJECTIVES 3
- MAJOR DEFICIENCIES (REJECTED DATA) 4
- MINOR DEFICIENCIES 4
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200-UP-1
Data Validation Narrative

INTRODUCTION

All samples in Sample Delivery Group (SDG) BOBKJ7-TMA-744 were validated at level "D" as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002) and/or Data Validation Procedures for Radiochemical Analyses (WHC-SD-EN-SPP-001).

The data package was received by Los Alamos Technical Associates (LATA) on June 17, 1994. Validation began on July 13, 1994 and was completed on August 1, 1994.

The chemical analyses were performed by TMA. Samples requiring radiochemical analyses were analyzed by TMA.

ANALYSES REQUESTED

Two (2) water samples numbered BOBKJ7, and BOBKJ8 were collected on April 8, 1994 by WHC and transferred to TMA for analysis. The following determinations were conducted on all of the samples in this SDG:

Volatile Organics	Method CLP SOW, Rev. 0LM01.8

A subset of the SDG which includes one (1) water sample numbered BOBKJ8 was analyzed for the following:

Pesticides/PCBs	Method CLP SOW, Rev. 0LM01.8
Anions (F, Cl, NO_2, NO_3, & SO_4)	Method 300.0
Nitrate+Nitrite	Method 353.2
Total Uranium	Method LAB SPECIFIC
Uranium-234, -235, -238	Method LAB SPECIFIC
Gross Alpha/Beta	Method EP-10
Strontium-90	Methods LAB SPECIFIC
Technetium-99	Methods LAB SPECIFIC

COMMENTS

Phophate was analyzed and reported as requested on the referenced Sample Analysis Form (SAF). It was overlooked on the SAR.

DATA QUALITY OBJECTIVES

The data quality objectives for 200-UP-1 are specified in the *Remedial Investigation/Feasibility Study Work Plan for the 200-UP-1, Groundwater Operable Unit* (DOE-RL-92-76 Rev. 0). The primary objective of the data validation effort was to ensure these data quality objectives were met, and that the data are usable and defensible. This was accomplished through a detailed examination of the data package to recreate the analytical process and verify that proper and acceptable analytical techniques had been applied. The data package was checked for correct submission of required deliverables, correct transcription of raw data to the summary forms, and for proper calculation of a number of parameters.

Precision. Goals for precision were met with the exception of those discussed in the "**MINOR DEFICIENCIES**" section of this report.

Accuracy

CHECKLIST FOR ACCURACY	VOA	Pest/ PCB	GC	RAD
Surrogates Analyzed	Y	Y	N/A	N/A
Surrogates Acceptable	Y	Y	N/A	N/A
MS and/or MSD Analyzed	Y	Y	Y	Y
MS and/or MSD Acceptable	Y	N	Y	N
LCS Analyzed	N/A	N/A	Y	Y
LCS Acceptable	N/A	N/A	Y	Y

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

Detection Limits. Detection limit goals were met for all samples with the exception of those listed in the "**MAJOR DEFICIENCIES**" section of this report.

Completness. All technical verification documentation is present in the data package.

Data qualifiers are assigned to any results that have been determined to be deficient. These are discussed below.

MAJOR DEFICIENCIES (REJECTED DATA)

The following major deficiencies resulted in the qualification of the results as unusable.

•Holding times for nitrite and phosphate were grossly exceeded. The results were qualified as non-detected (UR).

MINOR DEFICIENCIES

The following minor deficiencies were discovered. These minor shortcomings are not expected to significantly affect the overall quality of the data.

VOLATILES, Method CLP SOW, Rev. 0LM01.8

- For samples BOBKJ7 and BOBKJ8, methylene chloride was <10 times the associated blank result. Therefore, results are qualified as undetected (U).

- For sample BOBKJ7, acetone was <10 times the associated blank result. Therefore, results are qualified as undetected (U).

PESTICIDES/PCBS, CLP SOW, Rev. 0LM01.8

- The matrix spike/matrix spike duplicate were inadvertantly spiked with Aroclor-1254 instead of the pesticide spiking compounds. Therefore, all results except Aroclor and Toxaphene were qualified as estimated, non-detect (UJ).

GENERAL CHEMISTRY

Anions (F, Cl, NO_2, NO_3, & SO_4), Method 300.0

- The holding time was grossly exceeded (>2x HT) for NO_3. The result is qualified as estimated (J).

- The RPD for fluoride was >20%. The result was qualified as estimated (J).

Nitrate+Nitrite, Method 353.1

- No deficiencies were observed.

RADIOCHEMISTRY

Total Uranium, Method LAB SPECIFIC

- No deficiencies were observed.

MINOR DEFICIENCIES (cont.)

RADIOCHEMISTRY

Uranium-234, -235, -238, Method LAB SPECIFIC

- The detector efficiency had not been checked within 7 days of the analysis for the α spectrometric analysis. The U-238, U-233/4 results were qualified as estimated (J).

Gross Alpha/Beta, Method EP-10

- The duplicate RPD was >20% for gross alpha. The result was qualified as estimated (J).

Strontium-90, Methods LAB SPECIFIC

- No deficiencies were observed.

Technetium-99, Methods LAB SPECIFIC

- No deficiencies were observed.

Comments:

MDA were not met for U(isotopic) and U(total) analyses. No qualifier was needed.

9613503.0421

REFERENCES

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

WHC 1993, *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-SPP-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

WHC 1994, *Remedial Investigation/Feasibility Study Work Plan for the 200-UP-1, Groundwater Operable Unit*, DOE-RL-92-76 Rev. 0, Hanford Site, Richland, Washington.

DATA VALIDATION APPLIED QUALIFIERS

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate.

J- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision making purposes.

BJ- Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency the data are unusable.

UR- Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data are unusable due to an identified QC deficiency.

JN- Indicates a tentatively identified compound (TIC) that has been determined to be valid in terms of identification and quantitation.

UJN- Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

NJ- Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific application (i.e., usable for decision making purposes).

N- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision making purposes).

LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Organic Data Qualifiers

U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

J- Indicates an estimated value. This flag is used when estimating concentrations of tentatively identified compounds (TICs) or when the presence of a TCL compound is confirmed at a concentration of less than the CRQL but greater than the IDL.

N- Indicates presumptive evidence of a compound. This flag is used only by the laboratory for TIC results when the identification is based on a mass spectral library search.

P- This flag is used for pesticide/Aroclor target analytes when there is greater than 25% difference for detected values between the quantitation and confirmation GC columns. The lower of the two concentrations is reported on the report form and the result is flagged with a "P".

C- This flag applies to pesticide results where the identification has been confirmed by GC/MS. This flag should not be used by the laboratory if GC/MS confirmation was attempted but unsuccessful, in which case, the laboratory should use an "X" flag as defined below. The "X" flag is then defined in the SDG narrative.

B- This flag applies to results in which the analyte was detected in both the sample and the associated blank. The combination of the "B" flag with the "U" flag ("BU" or "UB") is expressly prohibited in the analytical SOW.

E- This flag identifies compounds whose concentrations exceed the calibrated range of the GC/MS instrument.

D- This flag identifies compounds identified in an analysis at a secondary dilution factor.

A- Indicates a TIC which is a suspected aldol-condensate product.

X- This is a non-specific flag used to properly define the results. If used, this flag must be properly defined within the body of the SDG.

LABORATORY APPLIED QUALIFIERS

Inorganic Qualifiers

U- Indicates the analyte was analyzed for but not detected in the sample.

B- Indicates the analyte concentration is less than the CRDL but greater than the IDL.

E- Indicates the value reported is estimated due to the presence of interference.

M- Indicates duplicate injection precision criteria were not met during graphite furnace (GFAA) analysis.

N- Indicates spiked sample recovery was not within the control limits.

S- Indicates the reported value was determined by the Method of Standard Additions (MSA).

W- Indicates post-digestion spike for GFAA analysis is outside control limits and the sample absorbance is less than 50% of the spike absorbance.

*- Indicates duplicate analysis was not within control limits.

+- Indicates the correlation coefficient (r) for the MSA was less than 0.995.

9613503.0425

Data Qualification Summary

00009A
~~000008A~~

DATA QUALIFICATION SUMMARY

SDG:B0BKJ7-TMA-744			
Compound/Analyte	**Qualifier**	**Samples Affected**	**Reasons**
alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, Heptachlor epoxide, Endosulfan I, Dieldrin, 4,4'-DDE, Endrin, Endosulfan II, 4,4'-DDD, Endosulfan Sulfate, 4,4'-DDT, Methoxychlor, Endrin Ketone, Endrin Aldehyde, alpha-Chlordane, gamma-Chlordane, Heptachlor	UJ	B0BKJ7	No Matrix Spike
Aldrin	UJ	B0BKJ7	No Matrix Spike
Nitrite, Phosphate	UR	B0BKJ7	Hold Time
Nitrate	J	B0BKJ7	Hold Time
Fluoride	J	B0BKJ7	Relative Percent Difference > 20%
Alpha	J	B0BKJ7	Relative Percent Difference > 20%
Uranium-233/234, Uranium-235, Uranium-238	J	B0BKJ7	Efficiency > 7 days old
Methylene Chloride	U	B0BKJ7, B0BKJ8	Blank
Acetone	U	B0BKJ7	Blank

entered by: X H.
date: 7/29/94

QTMA744

checked by: BH
date: 7/29/94

9613503.0427

Data Summary Tables

9613503.0428

PESTICIDE/PCB DATA SUMMARY TABLE

FILE #:401.75		HEIS #:	B0BKJ7	
		Date:	8-Apr-94	
		Matrix:	WATER	
Constituent	CAS #	Units	Results	Q
alpha-BHC	319-84-6	µg/L	0.05	UJ
beta-BHC	319-85-7	µg/L	0.05	UJ
delta-BHC	319-86-8	µg/L	0.05	UJ
gamma-BHC (Lindane)	58-89-9	µg/L	0.05	UJ
Heptachlor	76-44-8	µg/L	0.05	UJ
Aldrin	309-00-2	µg/L	0.05	UJ
Heptachlor Epoxide	1024-57-3	µg/L	0.05	UJ
Endosulfan I	959-98-8	µg/L	0.05	UJ
Dieldrin	60-57-1	µg/L	0.1	UJ
4,4'-DDE	72-55-9	µg/L	0.1	UJ
Endrin	72-20-8	µg/L	0.1	UJ
Endosulfan II	33213-65-9	µg/L	0.1	UJ
4,4'-DDD	72-54-8	µg/L	0.1	UJ
Endosulfan Sulfate	1031-07-8	µg/L	0.1	UJ
4,4'-DDT	50-29-3	µg/L	0.1	UJ
Methoxychlor	72-43-5	µg/L	0.5	UJ
Endrin Aldehyde	7421-36-3	µg/L	0.1	UJ
Endrin Ketone	53494-70-5	µg/L	0.1	UJ
alpha-Chlordane	5103-71-9	µg/L	0.05	UJ
gamma-Chlordane	5103-74-2	µg/L	0.05	UJ
Toxaphene	8001-35-2	µg/L	5	U
Aroclor-1016	12674-11-2	µg/L	1	U
Aroclor-1221	11104-28-2	µg/L	2	U
Aroclor-1232	11141-16-5	µg/L	1	U
Aroclor-1242	53469-21-9	µg/L	1	U
Aroclor-1248	12672-29-6	µg/L	1	U
Aroclor-1254	11097-69-1	µg/L	1	U
Aroclor-1260	11096-82-5	µg/L	1	U

entered by: [illegible]
date: [illegible] 29, 94

shaded areas represent a change by the validator
TMA 744

checked by: GH
date: 7/29/94

9613503.0429

VOLATILE ORGANICS DATA SUMMARY TABLE

FILE#: VW401.75		HEIS #:	B0BKJ7		B0BKJ8	
		Date:	8-Apr-94		8-Apr-94	
		Matrix:	WATER		WATER	
Constituent	CAS #	Units	Results	Q	Results	Q
Chloromethane	74-87-3	µg/L	10	U	10	U
Bromomethane	74-83-9	µg/L	10	U	10	U
Vinyl Chloride	75-01-4	µg/L	10	U	10	U
Chloroethane	75-00-3	µg/L	10	U	10	U
Methylene Chloride	75-09-2	µg/L	1	U	3	U
Acetone	67-64-1	µg/L	20	U	10	U
Carbon Disulfide	75-15-0	µg/L	10	U	10	U
1,1-Dichloroethene	75-35-4	µg/L	10	U	10	U
1,1-Dichloroethane	75-34-3	µg/L	10	U	10	U
1,2-Dichloroethene	540-590	µg/L	10	U	10	U
Chloroform	67-66-3	µg/L	3	J	10	U
1,2-Dichloroethane	107-06-2	µg/L	10	U	10	U
2-Butanone	78-93-3	µg/L	10	U	10	U
1,1,1-Trichloroethane	71-55-6	µg/L	10	U	10	U
Carbon Tetrachloride	56-23-5	µg/L	170		10	U
Bromodichloromethane	75-27-4	µg/L	10	U	10	U
1,2-Dichloropropane	78-87-5	µg/L	10	U	10	U
cis-1,3-Dichloropropene	10061-01-5	µg/L	10	U	10	U
Trichloroethene	79-01-6	µg/L	10	U	10	U
Dibromochloromethane	124-48-1	µg/L	10	U	10	U
1,1,2-Trichloroethane	79-00-5	µg/L	10	U	10	U
Benzene	71-43-2	µg/L	10	U	10	U
trans-1,3-Dichloropropene	10061-02-6	µg/L	10	U	10	U
Bromoform	75-25-2	µg/L	10	U	10	U
4-Methyl-2-Pentanone	108-10-1	µg/L	10	U	10	U
2-Hexanone	591-78-6	µg/L	10	U	10	U
Tetrachloroethene	127-18-4	µg/L	10	U	10	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	10	U	10	U
Toluene	108-88-3	µg/L	10	U	10	U
Chlorobenzene	108-90-7	µg/L	10	U	10	U
Ethylbenzene	100-41-4	µg/L	10	U	10	U
Styrene	100-42-5	µg/L	10	U	10	U
Xylene (Total)	1330-20-7	µg/L	10	U	10	U

shaded areas represent changes by the validator
TMA 744

entered by: Q H
date: 7/29/94

checked by: BH
date: 7/29/94

9613503.0430

RADIOCHEMISTRY DATA SUMMARY

FILE #:VW401.75		HEIS #:	BOBKJ7		
		Date:	8-Apr-94		
		Matrix:	WATER		
Constituent	CAS #	Units	Results	Q	MDA
Gross Alpha	Alpha	pCi/L	350	J	2
Gross Beta	Beta	pCi/L	180		2
Strontium-90	10098-97-2	pCi/L	0.21	U	0.7
Technetium-99	14133-76-7	pCi/L	29		2
Uranium-233/234	15046-61-1	pCi/L	180	J	0.9
Uranium-235	15117-96-1	pCi/L	14	J	0.2
Uranium-238	13994-20-2	pCi/L	180	J	0.8
Total Uranium	7440-61-1	ug/L	610		4

entered by: [illegible]
date: 7/29/94

shaded areas indicate changes by validator
TMA744

Checked by: DH
date: 7/29/94

9613503.0431

GENERAL CHEMISTRY DATA SUMMARY TABLE

FILE #: VW 401.75		HEIS #:	B0BKJ7 -1	
		Date:	8-Apr-94	
		Matrix:	WATER	
Constituent	CAS #	Units	Results	Q
Chloride by IC	16887-00-6	mg/L	11.90	
Fluoride by IC	16984-48-8	mg/L	0.40	J
Nitrite Nitrogen by IC	14797-65-0	mg/L	< 0.1	UR
Nitrate Nitrogen by IC	14797-55-8	mg/L	5.90	J
Phosphate by IC	14265-44-2	mg/L	< 0.4	UR
Sulfate by IC	14808-79-8	mg/L	29.00	
Nitrate + Nitrite	NO2 + NO3-N	mg/L	7.92	

Shaded areas represent changes
by validator
TMA744

entered by: MYS
date: 8/28/94

checked by: C.S.
date: 8-28-

000014

Sample Results (Form I's)

9615503.0433

000104

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKJ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R03

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	~~BJ~~ U
67-64-1	Acetone	20	~~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	3	J
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	170	
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

7/17/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BKJ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R03

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1/17/94

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKJ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R04

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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

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

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

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

7/17/94

9613503.0436

000121
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0BKJ8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 40415R04

Level: (low/med) LOW Date Received: 04/13/94

% Moisture: not dec. ____ Date Analyzed: 04/15/94

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/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

LW 7/17/94

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKJ7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 04035 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A404035-01B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: 04/13/94

Extraction: (SepF/Cont/Sonc) CONT Date Extracted: 04/14/94

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/21/94

Injection Volume: 1.00 (uL) Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
319-84-6	alpha-BHC	0.050	~~U~~	UJ
319-85-7	beta-BHC	0.050	~~U~~	UJ
319-86-8	delta-BHC	0.050	~~U~~	UJ
58-89-9	gamma-BHC (Lindane)	0.050	~~U~~	UJ
76-44-8	Heptachlor	0.050	~~U~~	UJ
309-00-2	Aldrin	0.050	~~U~~	UJ
1024-57-3	Heptachlor epoxide	0.050	~~U~~	UJ
959-98-8	Endosulfan I	0.050	~~U~~	UJ
60-57-1	Dieldrin	0.10	~~U~~	UJ
72-55-9	4,4'-DDE	0.10	~~U~~	UJ
72-20-8	Endrin	0.10	~~U~~	UJ
33213-65-9	Endosulfan II	0.10	~~U~~	UJ
72-54-8	4,4'-DDD	0.10	~~U~~	UJ
1031-07-8	Endosulfan sulfate	0.10	~~U~~	UJ
50-29-3	4,4'-DDT	0.10	~~U~~	UJ
72-43-5	Methoxychlor	0.50	~~U~~	UJ
53494-70-5	Endrin ketone	0.10	~~U~~	UJ
7421-36-3	Endrin aldehyde	0.10	~~U~~	UJ
5103-71-9	alpha-Chlordane	0.050	~~U~~	UJ
5103-74-2	gamma-Chlordane	0.050	~~U~~	UJ
8001-35-2	Toxaphene	5.0	U	
12674-11-2	Aroclor-1016	1.0	U	
11104-28-2	Aroclor-1221	2.0	U	
11141-16-5	Aroclor-1232	1.0	U	
53469-21-9	Aroclor-1242	1.0	U	
12672-29-6	Aroclor-1248	1.0	U	
11097-69-1	Aroclor-1254	1.0	U	
11096-82-5	Aroclor-1260	1.0	U	

BM 7-22-94

TMA Inc. REPORT Work Order # A4-04-035

Received: 04/13/94

Results by Sample

SAMPLE ID B0BKJ7 FRACTION 01E TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 04/08/94 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Chloride	300.0	11.9	mg/L	0.8	
Fluoride	300.0	0.4	mg/L	0.1	J
Phosphate	300.0	<0.4	mg/L	0.4	UR
Sulfate	300.0	29	mg/L	1	
Nitrate Nitrogen	300.0	5.9	mg/L	0.2	J
Nitrite Nitrogen	300.0	<0.1	mg/L	0.1	UR

FORM I

--

DW 7-15-94

9613503.0439

 *** T M A *** REPORT Work Order # S4-04-123

Received: 04/14/94 Results by Sample

SAMPLE ID BOBKJ7 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 04/08/94 Category WATER

NO3NO2 7.92
mg N/L

SAMPLE ID BOBKJ7D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 04/08/94 Category WATER

NO3NO2 7.67
mg N/L

SAMPLE ID BOBKJ7S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 04/08/94 Category WATER

NO3NO2 16.0
mg N/L

SAMPLE ID LCSW SAMPLE # 02 FRACTIONS: A
Date & Time Collected not specified Category WATER

NO3NO2 2.02
mg N/L

MW
7-15-94

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

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

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200

9613503.0440

TMA NORCAL

SAMPLE DELIVERY GROUP 7361

DATA SHEET

N404044-01

B0BKJ7

Case/SDG 94-088/7361
Client Westinghouse Hanford
Contact N. Joseph Verville
Contract MBH-SVV-069262

Lab sample id N404044-01
Client sample id B0BKJ7
Dept sample id 7361-001
Location/Matrix 200-UP-1 LIQUID
Received 04/13/94
Collected 04/08/94
Chain of custody id EFL-1124

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	Alpha	350	14	2	3	J	80A
Gross Beta	Beta	180	5.5	2	4		80B
Strontium 90	10098-97-2	0.21	1.2	0.7	2	U	Y
Technetium 99	14133-76-7	29	1.8	2	5		TC
Uranium 233/234		180	27	0.9	0.2	J	U
Uranium 235	15117-96-1	14	2.3	0.2	0.2	J	U
Uranium 238		180	27	0.8	0.2	J	U
Total Uranium (ug/L)	7440-61-1	610	120	4	0.1		U_T

MW 7-18-94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 05/20/94

9613503.0441

Checklists

9613503.0442

LATA GC/MS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1	SDG: BOBKJ7-TMA-744	
VALIDATOR: G. Westleigh	LATA NO.: VW401. 75	DATE: 7/13/94
SAF NO.: 94-088	LAB: TMA	CASE: 04-035
QAPP REFERENCE:	SAP REFERENCE:	

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

ANALYSES PERFORMED

☒ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (pac column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 8270 (pac column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX BOBKT7/Water, BOBKT8/Water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES *(see HOLDING TIME SUMMARY form)*

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

Comments: Water samples were preserved with HCl. Hold time was 7 days

GH 8/1/94

3. INSTRUMENT TUNING AND CALIBRATION *(see CALIBRATION DATA SUMMARY form)*

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

★ **VOA:** Verify the calculation of the mass abundance percentages for the 95/96, 176/177 and 174/176 ratios.

★ **SVOA:** Verify the calculation of the mass abundance percentages for the 199/198 and 443/442 ratios.

Are initial calibrations acceptable? . . . . . Yes No N/A

★ Verify the RRF and %RSD values and recalculate the individual and average RRF values and RSD values for two TCL compounds for Volatiles (V) and Semivolatiles (S).

★

Relative Response Factor

$$RRF = \frac{A_x C_{is}}{A_{is} C_x}$$

where:

A_x (V/S) = area of the characteristic ion measured for the sample
A_{is} (V/S) = area of the characteristic ion measured for the internal standard
C_x (V/S) = concentration [(VOA ng) (SVOA ng/µL)] of the compound of interest
C_{is} (V/S) = concentration [(VOA ng) (SVOA ng/µL)] of the associated internal standard

★

Relative Standard Deviation

$$\%RSD = \frac{STDEV}{MEAN} \times 100$$

where:

MEAN = mean of the initial five relative response factors
STDEV = standard deviation of the initial five RRFs per compound

$$= \sqrt{\sum_{i=1}^{n} \frac{(RRF_i - \overline{RRF})^2}{n-1}}$$

Are continuing calibrations acceptable? . . . . . Yes No N/A

★ Verify that the RRF and %D values are within the required limits and recalculate the individual RRF and %D values for at least two TCL compounds for Volatiles (V) and Semivolatiles (S).

★

Percent Difference

$$\%D = \frac{(RRF_i - RRF_s)}{RRF_i} \times 100$$

where:

RRF_i (V/S) = initial calibration average relative response factor
RRF_s (V/S) = continuing calibration average relative response factor

Comments: _____

BH 8/1/94

LATA GC/MS DATA VALIDATION CHECKLIST

4. BLANKS *(see BLANK AND SAMPLE DATA SUMMARY form)*

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Comments: For Sample BOBKJ7, Methylene Chloride is < CRQL & is < 10 times associated blank result. Acetone is > CRQL & is < 10 times the associated blank result. Results qualified ~~estimated~~ as undetected (U)

For Sample BOBKJ8, Methylene Chloride is < CRQL & is < 10 times associated blank result. Result qualified as undetected (U)

5. ACCURACY *(see ACCURACY DATA SUMMARY form)*

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are all surrogate/System Monitoring Compound recoveries acceptable? . . . . . Yes No N/A

★

Surrogate Recovery

$$\%R = \left(\frac{Q_d}{Q_a}\right) \times 100$$

where:
Q_d (V/S) = quantity of surrogate determined (analysis result)
Q_a (V/S) = quantity of surrogate added (true value)

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

Are all MS/MSD recoveries acceptable? . . . . . Yes No N/A

★

Spike Recovery

$$MS\%R = \frac{MS - OS}{SA} \times 100 \quad \text{or} \quad MSD\%R = \frac{MSD - OS}{SA} \times 100$$

where:
MS/MSD (V/S) = spiked sample result
OS (V/S) = sample result
SA (V/S) = spike added

Comments: _____

BH 8/1/96

6. PRECISION *(see PRECISION DATA SUMMARY form)*

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

★

Relative Percent Difference

$$RPD = \frac{|MS - MSD|}{\left(\frac{MS + MSD}{2}\right)} \times 100$$

where =
MS = MS recovery
MSD = MSD recovery

Comments:

7. FIELD QC SAMPLES

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified? Yes No N/A

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

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

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

Are performance audit sample results acceptable? . . . . . Yes No N/A

Comments:

8. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

BH 8/1

9. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

★

Results Calculations for VOA water (VW) samples

$$\text{Concentration } (\mu g/L) = \frac{(A_x VW)\ (I_s VW)\ (D_f VW)}{(A_{is} VW)\ (RRFVW)\ (V_o VW)}$$

where:

$A_x VW$ = area of the quantitation ion (EICP) for the compound of interest
$A_{is} VW$ = area of the quantitation ion (EICP) for the specified internal standard
$I_s VW$ = amount of internal standard added (ng)
RRFVW = relative response factor (ambient temperature purge of the calibration standard)
$V_o VW$ = volume of water purged (ml)
$D_f VW$ = dilution factor

★

Results Calculations for VOA soil/sediment (VLS) samples (low level)

$$\text{Concentration } (\mu g/Kg) = \frac{(A_x VLS)\ (I_s VLS)}{(A_s VLS)\ (RRFVLS)\ (W_s VLS)\ (SVLS)}$$

where:

$A_x VLS$ = area of the quantitation ion (EICP) for the compound of interest
$A_{is} VLS$ = area of the quantitation ion (EICP) for the specified internal standard
$I_s VLS$ = amount of internal standard added (ng)
RRFVLS = relative response factor (ambient temperature purge of the calibration standard)
$W_s VLS$ = weight of sample added (g)
SVLS = dry weight conversion factor [(100 - %moisture)/100]

★

Results Calculations for VOA soil/sediment (VMS) samples (medium level)

$$\text{Concentration } (\mu g/Kg) = \frac{(A_x VMS)\ (I_s VMS)\ (V_t VMS)\ (1000)\ (D_f VMS)}{(A_{is} VMS)\ (RRFVMS)\ (V_a VMS)\ (W_s VMS)\ (SVMS)}$$

where:

$A_x VMS$ = area of the quantitation ion (EICP) for the compound of interest
$A_{is} VMS$ = area of the quantitation ion (EICP) for the specified internal standard
$I_s VMS$ = amount of internal standard added (ng)
RRFVMS = relative response factor (ambient temperature purge of the calibration standard)
$W_s VMS$ = weight of sample extracted (g)
$D_f VMS$ = dilution factor
SVMS = dry weight conversion factor [(100 - %moisture)/100]
$V_t VMS$ = total volume methanol extract (ml)
$V_a VMS$ = volume of the aliquot (ml)

BH 8/1/94

9. COMPOUND IDENTIFICATION AND QUANTITATION (continued)

★

Results Calculations for SVOA water (SW) samples

$$\text{Concentration } (\mu g/L) = \frac{(A_x SW)\ (I_s SW)\ (V_t SW)\ (D_f SW)}{(A_{is} SW)\ (RRFSW)\ (V_o SW)\ (V_i SW)}$$

where:

$A_x SW$ = area of the quantitation ion (EICP) for the compound of interest
$A_{is} SW$ = area of the quantitation ion (EICP) for the specified internal standard
$I_s SW$ = amount of internal standard added (ng)
RRFSW = relative response factor for the daily calibration standard
$V_o SW$ = volume of water extracted (ml)
$V_i SW$ = volume of extract injected (µL)
$V_t SW$ = volume of concentrated extract (µL)
$D_f SW$ = dilution factor

★

Results Calculations for SVOA soil/sediment (SS) samples

$$\text{Concentration } (\mu g/Kg) = \frac{(A_x SS)\ (I_s SS)\ (V_t SS)\ (D_f SS)}{(A_{is} SS)\ (RRFSS)\ (V_i SS)\ (W_s SS)\ (SSS)}$$

where:

$A_x SS$ = area of the quantitation ion (EICP) for the compound of interest
$A_{is} SS$ = area of the quantitation ion (EICP) for the specified internal standard
$I_s SS$ = amount of internal standard added (ng)
RRFSS = relative response factor for the daily calibration standard
$W_s SS$ = weight of sample extracted (g)
$D_f SS$ = dilution factor
SSS = dry weight conversion factor [(100 - %moisture)/100]
$V_t SS$ = total volume of concentrated extract (µL)
$V_i SS$ = volume of the extract injected (µL)

Comments: _____

10. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments: _____

GH 8/1/94

LATA GC/MS DATA VALIDATION CHECKLIST

VALIDATION SUMMARY

MAJOR DEFICIENCIES:

MINOR DEFICIENCIES:

For samples BBBKJ7 + BBBKJ8, methylene chloride is <10 times the associated blank result.

For sample BBBKJ7, ~~Methylene~~ Acetone is > CRQL + <10 times the associated blank result. Therefore, results are qualified as undetected (U)

COMMENTS:

GH 8/1/94

HOLDING TIME SUMMARY

SDG: BOBKJ7-TMA-744	VALIDATOR: G. Westleigh	DATE: 13-Jul-94
COMMENTS:		

FIELD SAMPLE ID	MATRIX	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP HT (days)	*Required HT (days)*	ANALYSIS HT (days)	*Required HT (days)*	QUALIFIER
BOBKT7	WATER	VOA	08-Apr-94		15-Apr-94	0		7		NONE
BOBKT8	WATER	VOA	08-Apr-94		15-Apr-94	0		7		NONE

9415042.0449

000032

BLANK AND SAMPLE DATA SUMMARY

SDG:	BOBKJ7-TMA-744	VALIDATOR: G. Westleigh							DATE:	13-Jul-94
COMMENTS:	0									
FIELD SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0415R	methylene chloride	1.0	BJ			2	5	10	BOBKJ7	U
VBLK0415R	acetone	20.0	B			40	100	200	BOBKJ7	U
VBLK0415R	methylene chloride	3.0	BJ			6	15	30	BOBKJ8	U

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RELATIVE RESPONSE FACTOR

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID: Init. Cal. Standard 10,20,50 ppb

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	Response for Analyte of Interest AxV	Concentration of Internal Standard CisV	Area of Internal Standard AisV	Concentration of Analyte of Interest CxV	RRF
chloromethane	8517.00	50.00	28787.00	10.00	1.5
bromomethane	9039.00	50.00	28787.00	10.00	1.6
vinyl chloride	8140.00	50.00	28787.00	10.00	1.4
chloroethane	4921.00	50.00	28787.00	10.00	0.9
methlyene chloride	10637.00	50.00	28787.00	10.00	1.8
acetone	1859.00	50.00	28787.00	10.00	0.3
chloromethane	14776.00	50.00	27894.00	20.00	1.3
bromomethane	15184.00	50.00	27894.00	20.00	1.4
vinyl chloride	14497.00	50.00	27894.00	20.00	1.3
chloroethane	8639.00	50.00	27894.00	20.00	0.8

RELATIVE RESPONSE FACTOR

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Target Constituent	Response for Analyte of Interest AxS	Concentration of Internal Standard CisS	Area of Internal Standard AisS	Concentration of Analyte of Interest CxS	RRF
methlyene chloride	18405.00	50.00	27894.00	20.00	1.6
acetone	3508.00	50.00	27894.00	20.00	0.3
chloromethane	47970.00	50.00	32147.00	50.00	1.5
bromomethane	50992.00	50.00	32147.00	50.00	1.6
vinyl chloride	51601.00	50.00	32147.00	50.00	1.6
chloroethane	29001.00	50.00	32147.00	50.00	0.9
methlyene chloride	46554.00	50.00	32147.00	50.00	1.4
acetone	10527.00	50.00	32147.00	50.00	0.3
					#DIV/0!
					#DIV/0!

RELATIVE STANDARD DEVIATION

Analysis GC/MS VOA
SDG: BOBKJ7-TMA-744 Date: 13-Jul-94
Sample ID: Validator: G. Westleigh

Constituent: chloromethane

RRF1	MEAN	STDEV	RSD
1.479	1.488	0.1029	6.9
1.324			
1.492			
1.594			
1.552			

RELATIVE STANDARD DEVIATION

Analysis GC/MS VOA
SDG: BOBKJ7-TMA-744 Date: 13-Jul-94
Sample ID: Validator: G. Westleigh

Constituent: Bromomethane

RRF2	MEAN	STDEV	RSD
1.57	1.614	0.1790	11.1
1.361			
1.586			
1.843			
1.709			

RELATIVE STANDARD DEVIATION

Analysis GC/MS SVOA
SDG: BOBKJ7-TMA-744 Date: 13-Jul-94
Sample ID: Validator: G. Westleigh

Constituent: vinly chloride

RRF3	MEAN	STDEV	RSD
1.414	1.637	0.2981	18.2
1.299			
1.605			
1.848			
2.019			

RELATIVE STANDARD DEVIATION

Analysis GC/MS SVOA
SDG: BOBKJ7-TMA-744 Date: 13-Jul-94
Sample ID: Validator: G. Westleigh

Constituent: chloroethane

RRF4	MEAN	STDEV	RSD
0.855	0.903	0.0960	10.6
0.774			
0.902			
1.024			
0.96			

PERCENT DIFFERENCE

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	Initial Calibration Average RRF RRFiV	Continuing Calibration Average RRF RRFsV	%D
bromomethane	1.614	1.508	6.6%
vinyl chloride	1.637	1.579	3.5%
chloroethane	0.903	0.932	3.2%
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

PERCENT DIFFERENCE

Analysis: GC/MS SVOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	Initial Calibration Average RRF RRFiS	Continuing Calibration Average RRF RRFsS	%D
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

SURROGATE RECOVERY

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID: BOBKJ7

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	quantity of surrogate determined QdV	quantity of surrogate added QaV	%RV
D4-1, 2-Dichloroethane	46.03	50.00	92.1%
Toluene-d8	48.22	50.00	96.4%
Bromoflourobenzene	47.26	50.00	94.5%
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

SURROGATE RECOVERY

Analysis: GC/MS SVOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	quantity of surrogate determined QdS	quantity of surrogate added QaS	%RS
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

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PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (MS/MSD)

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	MS Result MSV	MSD Result MSDV	Sample Result OSV	Spike Added SAV	MSV %R	MSDV %R	RPDV
1,1-Dichloroethen	39.00	37.30	0.00	50.00	78.0%	74.6%	4.5%
trichloroethene	46.40	44.90	0.00	50.00	92.8%	89.8%	3.3%
benzene	43.00	42.10	0.00	50.00	86.0%	84.2%	2.1%
toluene	45.20	43.70	0.00	50.00	90.4%	87.4%	3.4%
chlorobenzene	46.80	43.90	0.00	50.00	93.6%	87.8%	6.4%
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!

PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (MS/MSD)

Analysis: GC/MS SVOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	MS Result MSS	MSD Result MSDS	Sample Result OSS	Spike Added SAS	MSS %R	MSDS %R	RPDS
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!
					#DIV/0!	#DIV/0!	#DIV/0!

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RESULTS CALCULATIONS FOR VOA WATER SAMPLES

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	Area of the Quant Ion for the Constituent of Interest	Area of the Quant Ion for the Internal Standard	Amount of Internal Standard added (ng)	Relative Response Factor	Volume of Water Purged (ml)	Dilution Factor	Conc (µg/L)
	AxVW	AisVW	IsVW	RRFVW	VoVW	DfVW	
Carbon Tetrachlorid	222789.00	127398.00	250.00	0.50	5.00	1.00	174.53
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!

RESULTS CALCULATIONS FOR VOA SOIL/SEDIMENT SAMPLES (Low Level)

Analysis: GC/MS VOA
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: G. Westleigh

Constituent	Area of the Quant Ion for the Constituent of Interest	Area of the Quant Ion for the Internal Standard	Amount of Internal Standard added (ng)	Relative Response Factor	Weight of sample added (g)	Dry Weight Conversion (decimal)	Conc (µg/Kg)
	AxVLS	AisVLS	IsVLS	RRFVLS	WsVLS	DCVLS	
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!
							#DIV/0!

96/3503.0167

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LATA PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		SDG: BOBKJ7-TMA-744
VALIDATOR: B.MORRIS	LATA NO.: VW401.75	DATE: 7-20-94
SAF NO.: 94-088	LAB: TMA	CASE: 04-035
QAPP REFERENCE:		SAP REFERENCE:

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

ANALYSES PERFORMED

☑ CLP 3/90	☐ SW-846 8080	☐ SW-846 8081	☐	☐	☐

SAMPLES/MATRIX BOBKJ7/Water
~~BOBKJ8/Water~~ BM 9.12.94

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES *(see HOLDING TIME SUMMARY form)*

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

Comments: Time until extraction: 6 d
" " Analyzed: 7 d
(After extraction)

BH 8/1/94

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS *(see CALIBRATION DATA SUMMARY form)*

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

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

Are DBC retention times acceptable? . . . . . Yes No N/A

★

DBC Retention Time Percent Difference

$$\%D = \frac{(RT_i - RT_s)}{RT_i} \times 100$$

where:
RT_i = absolute retention time of DBC (initial standard)
RT_s = absolute retention time of DBC (subsequent standards/samples)

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

★ Recalculate the retention time windows for at least two pesticide compounds. For CLP, see the table in Section 8.4 for retention time windows from the mean retention time value. For SW-846, calculate the mean plus or minus three times the standard deviation as described in Method 8000A.

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

★

Percent Breakdown

$$\%breakdown = \frac{TDA}{TPA} \times 100$$

where:
(TDA) total degradation peak area = the total peak areas of DDE + DDD or endrin aldehyde + endrin ketone
(TPA) total peak area = the total of all associated peak areas for DDE, DDE + DDT or endrin aldehyde, endrin ketone + endrin

For confirmation by GC/MS; is the GC/MS tuning/performance check acceptable (use GC/MS checklist)? . . . . . Yes No N/A

Comments:

BH 8/1/94

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are all EVAL standard calibration factors and %RSD values acceptable? . . . . . Yes No N/A

Are all quantitation column calibration factor %RSD values acceptable? . . . . . Yes No N/A

★

Relative Standard Deviation

$$\%RSD = \frac{STDEV}{MEAN} \times 100$$

where:
MEAN = mean of the initial five response (calibration) factors
STDEV = standard deviation of the initial five RFs/CFs per compound

$$= \sqrt{\sum_{i=1}^{n} \frac{(RF_i - \overline{RF})^2}{n-1}}$$

Were the analytical sequence requirements met? . . . . . Yes No N/A

Are all continuing calibration %D values acceptable? . . . . . Yes No N/A

★ Recalculate at least two of the %D values from the raw data and compare to the reported results.

★

Percent Difference

$$\%D = \frac{(RF_i - RF_s)}{RF_i} \times 100$$

where:
RF_i = initial calibration response (calibration) factor
RF_s = continuing calibration response (calibration) factor

Comments:

BH 8/1/94

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

Was the initial calibration sequence performed? . . . . . Yes No N/A

Was the resolution acceptable in the resolution check mix? . . . . . Yes No N/A

Is resolution acceptable in the PEM, INDA and INDB? . . . . . Yes No N/A

★

Resolution

$$\text{resolution} = \frac{P_v}{P_h} \times 100$$

where:
P_v = the peak height of the valley of the larger peak
P_h = the peak height of the smaller peak being resolved

Are DDT and Endrin breakdowns acceptable? . . . . . Yes No N/A

Are all retention times in PEMs and calibration mixes acceptable? . . . . . Yes No N/A

Are all RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are all %RSD values acceptable? . . . . . Yes No N/A

Comments: Several are out of Range, but no qualifier is nec. b/c of Non detect

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? . . . . . Yes No N/A

Is resolution acceptable in the PEMs? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are all retention times acceptable in the PEMs, INDA and INDB mixes? . . . . . Yes No N/A

Are all RPD values in the PEMs acceptable? . . . . . Yes No N/A

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

Was GPC cleanup performed? . . . . . Yes No N/A

Is the GPC calibration check acceptable? . . . . . Yes No N/A

Was Florisil cleanup performed? . . . . . Yes No N/A

Is the Florisil performance check acceptable? . . . . . Yes No N/A

Comments: Recovery of Endrin was > 110 %
Since sample was non detect and Endrin recovery was high no qualifier is necessary

BH 8/1/94

4. BLANKS *(see BLANK AND SAMPLE DATA SUMMARY form)*

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Comments:

5. ACCURACY *(see ACCURACY DATA SUMMARY form)*

Were surrogates analyzed? . . . . . Yes No N/A

Are all surrogate recoveries acceptable? . . . . . Yes No N/A

★

Surrogate Recovery

$$\%R = \left(\frac{Q_d}{Q_a}\right) \times 100$$

where:
Q_d = quantity of surrogate determined (analysis result)
Q_a = quantity of surrogate added (true value)

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

Are all MS/MSD recoveries acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A

Are all LCS results acceptable? . . . . . Yes No N/A

★

Spike Recovery

$$\%R = \frac{MS - OS}{SA} \times 100$$

where:
MS or MSD = spiked sample result
OS = sample result
SA = spike added

Comments: The MS/MSD Samples were not spiked with the Pesticide Spiking Compounds. They are qualified as UJ. The PCB's were spiked with Aroclor-1254 - so no qualifier.

GH 8/1/94

6. PRECISION *(see PRECISION DATA SUMMARY form)*

Are all duplicate RPD values acceptable? . . . . . Yes No N/A

★

Relative Percent Difference

$$RPD = \frac{|MS - MSD|}{\left(\frac{MS + MSD}{2}\right)} \times 100$$

where:
MS = MS recovery
MSD = MSD recovery

Comments:

7. FIELD QC SAMPLES

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified? . . . . . Yes No N/A

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

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

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

Are performance audit sample results acceptable? . . . . . Yes No N/A

Comments: Sample BOBKJ7 was split to BOBKJ3 and sent to IT

8. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? . . . . . Yes No N/A

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

Comments:

BH 8/1/9

9. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

★ Recalculate the valid detected results of at least two samples.

★

External Standard Calibration, Aqueous (EW) Samples

$$\text{Concentration } (\mu g/L) = \frac{(A_xEW)(AEW)(V_tEW)(DEW)}{(A_sEW)(V_iEW)(V_sEW)}$$

where:

A_xEW = response for sample (area counts/peak height)
AEW = amount of standard (ng)
A_sEW = response for external standard (area counts/peak height)
V_iEW = volume of extract injected (µL)
DEW = dilution factor
V_tEW = volume of total extract (µL)
V_sEW = volume of sample extracted (ml)

★

External Standard Calibration, Nonaqueous (ES) Samples

$$\text{Concentration } (\mu g/Kg) = \frac{(A_xES)(AES)(V_tES)(DES)}{(A_sES)(V_iES)(WES)(SES)}$$

where:

A_xES = response for sample (area counts/peak height)
AES = amount of standard (ng)
A_sES = response for external standard (area counts/peak height)
V_iES = volume of extract injected (µL)
DES = dilution factor
V_tES = volume of total extract (µL)
WES = weight of sample (g)
SES = dry weight conversion factor [(100 − %moisture)/100]

Comments:

GH 8/1/94

9. COMPOUND IDENTIFICATION AND QUANTITATION (continued)

★

Internal Standard Calibration, Aqueous (IW) Samples

$$\text{Concentration } (\mu g/L) = \frac{(A_x IW)(C_{is} IW)(DIW)}{(A_{is} IW)(RFIW)(V_s IW)}$$

where:

$A_x IW$ = response for sample (area counts/peak height)
$C_{is} IW$ = amount of internal standard added (ng)
$A_{is} IW$ = response for internal standard (area counts/peak height)
DIW = dilution factor
RFIW = response factor for the analyte
$V_s IW$ = volume of sample extracted (ml)

★

Internal Standard Calibration, Nonaqueous (IS) Samples

$$\text{Concentration } (\mu g/Kg) = \frac{(A_x IS)(C_{is} IS)(DIS)}{(A_{is} IS)(RFIS)(W_s IS)(SIS)}$$

where:

$A_x IS$ = response for sample (area counts/peak height)
$C_{is} IS$ = amount of internal standard added (ng)
$A_{is} IS$ = response for internal standard (area counts/peak height)
DIS = dilution factor
RFIS = response factor for the analyte
$W_s IS$ = weight of sample extracted (g)
SIS = dry weight conversion factor [(100 - %moisture)/100]

Comments:_____

10. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

Comments:_____

BH 8/1/94

LATA PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION SUMMARY

MAJOR DEFICIENCIES:

MINOR DEFICIENCIES:

The matrix spike / Matrix spike duplicate were inadvertently spiked with Aroclor-1254 instead of the Pesticide spiking compounds. The Samples contained the proper Surrogates so the data is qualified UJ.

COMMENTS:

GH 8/1/94

HOLDING TIME SUMMARY

SDG: BOBKJ7-7MA-7J4	VALIDATOR: B. MORRIS	DATE: 7-20.94	PAGE __ OF __

COMMENTS: PESTICIDES/PCBS

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBKJ7	Pest / PCBS	8-Apr-94	14-Apr-94	21-Apr-94	+3.6	-0.7	None
					BM 8-20-94	BM 8-29-94	

PNO-DVF-019, R1

000050

96135031967

ACCURACY DATA SUMMARY

SDG: BOBKJ7-TMA-744	VALIDATOR: B. Morris	DATE: 7-20-94	PAGE__OF__

COMMENTS: PESTICIDES/PCBS

FIELD SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER
BOBKJ7	ALL ORGANOCHLORINE PESTICIDES	~~0~~ BM 8-29-94	BOBKJ7	UJ
		NO spike added		

PNO-DVF-019, R1

96150509.0168

00051

DATA QUALIFICATION SUMMARY

SDG:	VALIDATOR:	DATE:	PAGE__OF_
BOBKJ7-SMA-744	B. MORRIS	7-20-94	

COMMENTS: GENERAL GC

COMPOUND	CAS No.	QUALIFIER	SAMPLES AFFECTED	MEDIA	REASON
alpha-BHC	319-84-6	UJ	BOBKJ7	Water	No Matrix Spike
beta-BHC	319-85-7	"	"	"	"
delta-BHC	319-86-8	"	"	"	"
gamma-BHC	58-89-9				
Heptachlor	76-44-8				
Aldrin	309-00-2				
Heptachlor epoxide	1024-57-3				
Endosulfan I	959-98-8				
Dieldrin	60-57-1				
4,4'-DDE	72-55-9				
Endrin	72-20-8				
Endosulfan II	33213-65-9				
4,4'-DDD	72-54-8				
Endosulfan Sulfate	1031-07-8				
4,4'-DDT	50-29-3				
Methoxychlor	72-43-5				
Endrin Ketone	53494-70-5				
Endrin Aldehyde	7421-36-3				
alpha-Chlordane	5103-71-9				
gamma-Chlordane	5103-74-2				

RELATIVE STANDARD DEVIATION

Analysis Pesticides/PCBs
SDG: BOBKJ7-TMA-744 Date: 21-Jul-94
Standard ID: Validator: B. Morris

RF1 Constituent: alpha BHC

	MEAN	STDEV	RSD
342	375.667	60.0528	16.0
340			
445			

RELATIVE STANDARD DEVIATION

Analysis Pesticides/PCBs
SDG: BOBKJ7-TMA-744 Date: 21-Jul-94
Standard ID: Validator: B. Morris

RF2 Constituent: DDT

	MEAN	STDEV	RSD
340	342.000	13.1149	3.8
330			
356			

RELATIVE STANDARD DEVIATION

Analysis Pesticides/PCBs
SDG: BOBKJ7-TMA-744 Date: 21-Jul-94
Standard ID: Validator: B. Morris

RF3 Constituent:

	MEAN	STDEV	RSD
	#DIV/0!	#DIV/0!	#DIV/0!

RELATIVE STANDARD DEVIATION

Analysis Pesticides/PCBs
SDG: BOBKJ7-TMA-744 Date: 21-Jul-94
Standard ID: Validator: B. Morris

RF4 Constituent:

	MEAN	STDEV	RSD
	#DIV/0!	#DIV/0!	#DIV/0!

96125061470

000053

SURROGATE RECOVERY

Analysis: Pesticides/PCBs
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 21-Jul-94
Validator: B. Morris

Constituent		quantity of surrogate determined Qd	quantity of surrogate added Qa	%R
TCX	MetBlk-col1	1.26E-02	0.02	63.0%
DCB	MetBlk-col1	1.40E-02	0.02	70.0%
TCX	MetBlk-col2	1.26E-02	0.02	63.0%
DCB	MetBlk-col2	1.45E-02	0.02	72.5%
TCX	BOBKJ7MS-col1	1.36E-02	0.02	68.0%
TCX	BOBKJ7MS-col2	1.38E-02	0.02	69.0%
				#VALUE!
				#VALUE!
				#VALUE!
				#VALUE!

EXTERNAL STANDARD CALIBRATION, AQUEOUS SAMPLES

Analysis: Pesticides/PCBs
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 34536
Validator: B. Morris

Constituent	Response for sample (area counts or peak height)	Amount of standard (ng)	Response for external standard (area counts or peak height)	Volume of extract injected (µL)	Dilution Factor	Volume of Total Extract (µL)	Volume of Sample Extracted (mL)	Conc (µg/L)
	AxEW	AEW	AsEW	ViEW	DEW	VtEW	VsEW	
alpha BHC	84691.00	0.02	4100000.00	1.00	5.00	10000.00	1000.00	2.07E-02
gamma BHC	86972.00	0.02	4220000.00	1.00	5.00	10000.00	1000.00	2.06E-02
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!
								#DIV/0!

9613503.0473

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E

PROJECT: 200-UP-1		SDG: BOBKJ7-TMA-744
VALIDATOR: M Webb	LATA NO: VW401.75	DATE: 7-13-94
SAF NO.: 94-088	LAB: ~~WE~~ TMA	CASE: 04-035
QAPP REFERENCE:		SAP REFERENCE:

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

ANALYSES PERFORMED

☐ Alkalinity 310.1	☐ Chloride 325.3	☐ pH 9040/150.1	☐ TOC 9060/415.1	☐ TDS 160.1 ☐ TSS 160.2	☐
☒ Anions 300.0	☐ Chromium+6 7196	☐ Phenols 9065/420.1	☐ TOX 9020/9022	☐ Sulfate 375.4	☐
☐ Ammonia 350.3	☐ COD 410.1	☐ Phosphorus 365.2	☐ TKN 351.3	☐ Sulfide 9030/376.1	☐
☐ BOD 405.1	☐ Nitrate+Nitrite 353.2	☐ Oil & Grease 413.1	☐ TPH 9070/418.1	☐	☐

SAMPLES/MATRIX BOBKJ7 (W)

Anions (Cl, F, SO_4) (28d)
⊥ (NO_2, NO_3, SO_4) (2d)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES *(see HOLDING TIME SUMMARY form)*

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

Comments: holding time was exceed by more than 2 times (2*2d) for. NO_2 / NO_3 & PO_4 Result qualified as JR/UR

GH 8/1/94

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION *(see CALIBRATION DATA SUMMARY form)*

Was initial calibration performed for all applicable analyses? . . . . . Yes No N/A

Are initial calibration results acceptable? . . . . . Yes No N/A

Was a calibration check performed for all applicable analyses? . . . . . Yes No N/A

Are calibration check results acceptable? . . . . . Yes No N/A

★ For methods requiring a calibration curve (three standards and a blank) use the following equation for correlation coefficient (r).

Correlation Coefficient (r)

$$r = \frac{N \sum x_i y_i - \sum x_i \sum y_i^{1/2}}{[N \sum x_i^2 - (\sum x_i)^2]^{1/2} \; [N \sum y_i^2 - (\sum y_i)^2]^{1/2}}$$

★ For methods requiring ICV/CCV or a calibration check standard, calculate recovery as follows:

Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments:

BH 8/1/94

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

4. BLANKS *(see BLANK AND SAMPLE DATA SUMMARY form)*

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Comments:

5. ACCURACY *(see ACCURACY DATA SUMMARY form)*

Were spike samples analyzed at the required frequency? . . . . . Yes No N/A

Are all spike recoveries acceptable? . . . . . Yes No N/A

★

Spike Recovery

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:
SSR = spiked sample result
SR = sample result
SA = spike added

Were LCS analyses performed at the required frequency? . . . . . Yes No N/A

Are all LCS recoveries acceptable? . . . . . Yes No N/A

★

Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments:

BH 8/1/94

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

6. PRECISION *(see PRECISION DATA SUMMARY form)*

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes No N/A

Are all duplicate RPD values acceptable? . . . . . Yes No N/A

★

Relative Percent Difference

$$RPD = \frac{|OS - D|}{\left(\frac{OS + D}{2}\right)} \times 100$$

where:
OS = sample concentration (original sample/MS)
D = duplicate concentration (duplicate sample/MSD)

Comments: F RPD >20% Result is qualified as J

7. FIELD QC SAMPLES

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified? Yes No N/A

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

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

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

Are performance audit sample results acceptable? . . . . . Yes No N/A

Comments:

BH 8/1/94

8. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

★ For methods with calibration curves:

General Chemistry Results Calculation, water sample

Concentration (µg/L) = CONCW × DfW

where:

CONCW = concentration off calibration curve (µg/L)

DfW = dilution factor (if any)

or

General Chemistry Results Calculation, soil sample

$$\text{Concentration (mg/Kg)} = \frac{(\text{CONCS} \times \text{DfS} \times \text{VOL})}{(\text{WS} \times \text{SS})}$$

where:

CONCS = concentration off calibration curve (mg/L)

VOL = volume of final extract (ml)

WS = weight of sample (g)

DfS = dilution factor (if any)

SS = dry weight conversion [(100 − %moisture) × 100]

★ For all other results calculations, see the analytical method.

Comments:

9. REPORTED RESULTS AND DETECTION LIMITS

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

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

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

Bit 8/1/94

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION SUMMARY

MAJOR DEFICIENCIES:

~~None~~ Hold time was grossly exceeded (> 2*HT) for NO_2, PO_4
the results are qualified UR

MINOR DEFICIENCIES:

holding time was grossly exceeded (> 2* HT) for ~~Sol~~ NO_{+3}
The result is qualified as estimated (J)

The RPD for F was > 20% the result is qualified as est. (J)

COMMENTS:

BH 8/1/94

HOLDING TIME SUMMARY

SDG:	VALIDATOR:	DATE:	PAGE __ OF __

COMMENTS: GENERAL CHEMISTRY ANALYSES

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
	NO2-NO3	4-8-94	5-2-94	5-2-94	24	0	none

HT 28d

PNO-DVF-013, R1

290300

HOLDING TIME SUMMARY

SDG: BOBKJZ-TMA-744	VALIDATOR: MWebb	DATE: 7-13-94	PAGE 1 OF 1

COMMENTS: GENERAL CHEMISTRY ANALYSES

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
	NO_2, ~~NO_3~~, PO_4	4-8-94	4-28-94	4-28-94	20	0	UR
	NO_3	4-8-94	4-28-94	4-28-94	20	0	J

AT

0840 5505 1961

000003

PRECISION DATA SUMMARY

SDG: BOBKJ7 TMA 744	VALIDATOR: Mujeb	DATE: 7-13-94	PAGE 1 OF 1

COMMENTS: GENERAL CHEMISTRY ANALYSES

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
~~NO~~ F	.4	.5	222	BOBKJ7	J

PNO-DVF-013, R1

9613503.0482

DATA QUALIFICATION SUMMARY

SDG: BOBKJ7 TMA-744	VALIDATOR: MWEDS	DATE: 7-13-94	PAGE 1 OF 1

COMMENTS: GENERAL GC

COMPOUND	CAS No.	QUALIFIER	SAMPLES AFFECTED	MEDIA	REASON
NO_2		UR	BOBKJ7	W	Hold time
PO_4		UR	BOBKJ7	W	Hold time
NO_3		J	BOBKJ7	W	Hold time
F		J	BOBKJ7	W	RPD > 20%

PNO-DVF-017, R1

LINEAR REGRESSION ANALYSIS

Analysis: General Chemistry
Constituent: Anions (F)
SDG: BOBKJ7-TMA-744

Calibration Date: 28-Apr-94

Date: 13-Jul-94
Validator: MC Webb

Concentration	Absorbance
0.00	0.000
0.19	653.000
0.38	1717.000
0.75	3350.000
1.50	7243.000
3.00	17869.000

r 0.9952	r^2 0.9904
slope 0.0002	x intercept 0.1148
1/slope 6017.0651	y intercept -634.6640

LINEAR REGRESSION ANALYSIS

Analysis: General Chemistry
Constituent:
SDG:

Calibration Date:

Date: 13-Jul-94
Validator: MC Webb

Concentration	Absorbance

r #DIV/0!	r^2 #DIV/0!
slope #DIV/0!	x intercept #DIV/0!
1/slope #DIV/0!	y intercept #DIV/0!

9613505.0183
000006

MATRIX SPIKE RECOVERY (MS)

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: MC Webb

Constituent	Spike Sample Result SSR	Sample Result SR	Spike Added SA	%R
Anion (F)	10.80	0.40	10.00	104.0%

PERCENT RECOVERY (ICV/CCV)

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744

Date: 13-Jul-94
Validator: MC Webb

Constituent	Observed Value	True Value	%R
	O	A	
Anion F	0.99	1.00	98.5%

PERCENT RECOVERY (LCS)

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744

Date: 13-Jul-94
Validator: MC Webb

Constituent	Observed value	True value	%R
	OLCS	ALCS	
Anion F	20.08	19.60	102.4%

961350G.0486

000329

RELATIVE PERCENT DIFFERENCE

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: MC Webb

Constituent	Original (Sample) concentration OS	Duplicate concentration D	RPD
Anion F	0.40	0.50	22.2

* Undetected; RPD criteria does not apply.

GENERAL CHEMISTRY RESULTS CALCULATION, WATER

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744
Sample ID:

Constituent	Concentration off Calibration Curve CONCS	Run Dilution Factor DfS	Concentration (mg/Kg)
Anion F	0.448	1	0.45

TIC	TC	TOC
Undetected	Undetected	Undetected

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E

PROJECT: 200-UP-1	SDG: BOBKJ7 - TMA - 744	
VALIDATOR: MWebb	LATA NO: VW401. 75	DATE: 7-13-94
SAF NO.: 94-088	LAB: TMA	CASE: ~~200-UP-1~~ N4-04-042
QAPP REFERENCE:	SAP REFERENCE:	

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

ANALYSES PERFORMED

☐ Alkalinity 310.1	☐ Chloride 325.3	☐ pH 9040/150.1	☐ TOC 9060/415.1	☐ TDS 160.1 ☐ TSS 160.2	☐
☐ Anions 300.0	☐ Chromium+6 7196	☐ Phenols 9065/420.1	☐ TOX 9020/9022	☐ Sulfate 375.4	☐
☐ Ammonia 350.3	☐ COD 410.1	☐ Phosphorus 365.2	☐ TKN 351.3	☐ Sulfide 9030/376.1	☐
☐ BOD 405.1	☒ Nitrate+Nitrite 353.2	☐ Oil & Grease 413.1	☐ TPH 9070/418.1	☐	☐

SAMPLES/MATRIX BOBKJ7 (W)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES *(see HOLDING TIME SUMMARY form)*

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

Comments:

BH 8/1/94

3. INSTRUMENT CALIBRATION *(see CALIBRATION DATA SUMMARY form)*

Was initial calibration performed for all applicable analyses? . . . . . Yes No N/A

Are initial calibration results acceptable? . . . . . Yes No N/A

Was a calibration check performed for all applicable analyses? . . . . . Yes No N/A

Are calibration check results acceptable? . . . . . Yes No N/A

★ For methods requiring a calibration curve (three standards and a blank) use the following equation for correlation coefficient (r).

Correlation Coefficient (r)

$$r = \frac{N \sum x_i y - \sum x_i \sum y_i^{1/2}}{[N \sum x_i^2 - (\sum x_i)^2]^{1/2} \; [N \sum y_i^2 - (\sum y_i)^2]^{1/2}}$$

★ For methods requiring ICV/CCV or a calibration check standard, calculate recovery as follows:

Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments:

SH 8/1/94

4. BLANKS *(see BLANK AND SAMPLE DATA SUMMARY form)*

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Comments:

5. ACCURACY *(see ACCURACY DATA SUMMARY form)*

Were spike samples analyzed at the required frequency? . . . . . Yes No N/A

Are all spike recoveries acceptable? . . . . . Yes No N/A

★

Spike Recovery

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:
SSR = spiked sample result
SR = sample result
SA = spike added

Were LCS analyses performed at the required frequency? . . . . . Yes No N/A

Are all LCS recoveries acceptable? . . . . . Yes No N/A

★

Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments:

GH 8/1/94

6. PRECISION *(see PRECISION DATA SUMMARY form)*

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes No N/A

Are all duplicate RPD values acceptable? . . . . . Yes No N/A

★

Relative Percent Difference

$$RPD = \frac{|OS - D|}{\left(\frac{OS + D}{2}\right)} \times 100$$

where:
OS = sample concentration (original sample/MS)
D = duplicate concentration (duplicate sample/MSD)

Comments:

7. FIELD QC SAMPLES

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified? Yes No N/A

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

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

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

Are performance audit sample results acceptable? . . . . . Yes No N/A

Comments:

BH 8/1/94

8. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

★ For methods with calibration curves:

General Chemistry Results Calculation, water sample

Concentration (µg/L) = CONCW × DfW

where:

CONCW = concentration off calibration curve (µg/L)

DfW = dilution factor (if any)

or

General Chemistry Results Calculation, soil sample

$$\text{Concentration (mg/Kg)} = \frac{(\text{CONCS} \times \text{DfS} \times \text{VOL})}{(\text{WS} \times \text{SS})}$$

where:

CONCS = concentration off calibration curve (mg/L)

VOL = volume of final extract (ml)

WS = weight of sample (g)

DfS = dilution factor (if any)

SS = dry weight conversion [(100 − %moisture) × 100]

★ For all other results calculations, see the analytical method.

Comments:

9. REPORTED RESULTS AND DETECTION LIMITS

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

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

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

BH 8/1/94

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION SUMMARY

MAJOR DEFICIENCIES:

None (NO_2 NO_3)

MINOR DEFICIENCIES:

None (NO_2 NO_3)

COMMENTS:

GH 8/1/94

LINEAR REGRESSION ANALYSIS

Analysis: General Chemistry
Constituent: NO2/NO3
SDG: BOBKJ7-TMA-744

Calibration Date: 2-May-94

Date: 13-Jul-94
Validator: MC Webb

Concentration	Absorbance
0.00	-3.000
0.10	18.000
1.00	180.000
2.00	307.000
5.00	693.000

r 0.9976	r^2 0.9951
slope 0.0072	x intercept -0.1076
1/slope 138.3397	y intercept 15.9814

LINEAR REGRESSION ANALYSIS

Analysis: General Chemistry
Constituent:
SDG:

Calibration Date:

Date: 13-Jul-94
Validator: MC Webb

Concentration	Absorbance

r #DIV/0!	r^2 #DIV/0!
slope #DIV/0!	x intercept #DIV/0!
1/slope #DIV/0!	y intercept #DIV/0!

820030

MATRIX SPIKE RECOVERY (MS)

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: MC Webb

Constituent	Spike Sample Result SSR	Sample Result SR	Spike Added SA	%R
NO2NO3	16.02	7.92	10.00	81.0%

PERCENT RECOVERY (ICV/CCV)

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744

Date: 13-Jul-94
Validator: MC Webb

Constituent	Observed Value O	True Value A	%R
NO2NO3	2.02	2.00	100.9%

PERCENT RECOVERY (LCS)

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744

Date: 13-Jul-94
Validator: MC Webb

Constituent	Observed value	True value	%R
	OLCS	ALCS	
NO2NO3	2.02	2.00	101.0%

RELATIVE PERCENT DIFFERENCE

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744
Sample ID:

Date: 13-Jul-94
Validator: MC Webb

Constituent	Original (Sample) concentration OS	Duplicate concentration D	RPD
NO2NO3	7.92	7.67	3.2%

* Undetected; RPD criteria does not apply.

GENERAL CHEMISTRY RESULTS CALCULATION, WATER

Analysis: General Chemistry
SDG: BOBKJ7-TMA-744
Sample ID:

Constituent	Concentration off Calibration Curve	Run Dilution Factor	Concentration (mg/Kg)
	CONCS	DfS	
NO2NO3	1.584	5	7.92

TIC	TC	TOC
Undetected	Undetected	Undetected

9613503.0501

LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E

PROJECT: 200-UP-1		DATA PACKAGE: BOBKJ7-TMA-744
VALIDATOR: MWebb	LAB: TMA	DATE: 7-15-94
~~CASE~~ SDG: BOBKJ7-TMA-744		~~SDG~~ CASE: N4-04-044-7361
QAPP REFERENCE:		SAP REFERENCE: SAF 94-088

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

ANALYSES PERFORMED

☒ Gross Alpha ☒ Gross Beta	☐ Strontium-89 ☒ Strontium-90	☒ Technetium-99	☒ Isotopic Anal. Alpha Spec.	☐ Gamma Spectroscopy	☐ Iodine-129
☒ Total Uranium (KPA)	☐ Radium-226 ☐ Radium-228	☐ (LSC) Liquid Scintillation	☐	☐	☐

SAMPLES/MATRIX BOBKJ7 (water)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification forms present? . . . . . (Yes) No N/A
Compliance screening form present? . . . . . Yes (No) N/A
Is a case narrative present? . . . . . (Yes) No N/A
Were all analyses requested reported? . . . . . (Yes) No N/A
Are all results supported in the raw data? . . . . . (Yes) No N/A
Comments:

2. CHAIN-OF-CUSTODY/HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A
Are samples preserved correctly? . . . . . (Yes) No N/A
Was the pH of the sample checked prior to analysis? . . . . MW 8-10-94 . . (Yes) (No) N/A
Comments: No evidence of the pH being checked before analysis. pH check is shown on the prep page OK

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3. INITIAL CALIBRATION

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes (No) N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments: No qualification necessary since the continuing calibration (background + efficiency standard) were acceptable. Counting equipment holds its calibration well. The efficiency checks will be out of limits when lab checks pH - found in prep section. MLP for M Webb

4. CONTINUING CALIBRATION

Background checked at proper frequency? . . . . . (Yes) No N/A

Background check acceptable? . . . . . (Yes) No N/A

Efficiency checked at proper frequency? . . . . . Yes (No) N/A

Efficiency check acceptable? . . . . . Yes (No) N/A

Calibration check standards NIST traceable? . . . . . (Yes) No N/A

Calibration check standards expired? . . . . . Yes (No) N/A

Comments: Eff check for S527 (α spec) > 7 days old. The results U238 / U235 / U233/4 are qualified as estimated J

5. BLANKS *(see BLANK AND SAMPLE DATA SUMMARY form)*

Method blank analyzed? . . . . . (Yes) No N/A

Method blank results acceptable? . . . . . (Yes) No N/A

Analytes detected in method blank? . . . . . Yes (No) N/A

Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments:

BH 8/1/94

6. MATRIX SPIKES *(see ACCURACY DATA SUMMARY form)*

Matrix spike analyzed? . . . . . Yes No N/A

Spike recoveries acceptable? . . . . . Yes No N/A

Spike source traceable? . . . . . Yes No N/A

Spike source expired? . . . . . Yes No N/A

Transcription/Calculation Errors? . . . . . Yes No N/A

★

Spike Recovery

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:
SSR = spiked sample result
SR = sample result
SA = spike added

Comments:

7. LABORATORY CONTROL SAMPLES *(see ACCURACY DATA SUMMARY form)*

LCS analyzed? . . . . . Yes No N/A

LCS recoveries acceptable? . . . . . Yes No N/A

LCS traceable? . . . . . Yes No N/A

Transcription/Calculation Errors? . . . . . Yes No N/A

★

Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments:

BH 8/1/94

8. CHEMICAL RECOVERY *(see ACCURACY DATA SUMMARY form)*

Chemical carrier added? . . . . . Yes No N/A

Chemical recovery acceptable? . . . . . Yes No N/A

Tracer added? . . . . . Yes No N/A

Tracer recovery acceptable? . . . . . Yes No N/A

Standards traceable? . . . . . Yes No N/A

Standards expired? . . . . . Yes No N/A

Transcription/Calculation errors? . . . . . Yes No N/A

★

Alpha Spec Tracer Recovery

$$\frac{A.1 - B.1}{(2.22)(E.1)(T.1)}$$

where:
- A.1 = gross counts per minute
- B.1 = background counts per minute of tracer
- 2.22 = conversion factor, dpm/pCi
- E.1 = detector efficiency
- T.1 = activity (pCi) of tracer added to sample (can be determined by taking dpm of tracer added divided by 2.22)

Comments:

9. DUPLICATES *(see PRECISION DATA SUMMARY form)*

Duplicates Analyzed? . . . . . Yes No N/A

RPD Values Acceptable? . . . . . Yes No N/A

Transcription/Calculation Errors? . . . . . Yes No N/A

★

Relative Percent Difference

$$RPD = \frac{|OS - D|}{\left(\frac{OS + D}{2}\right)} \times 100$$

where:
- OS = sample concentration (original sample/MS)
- D = duplicate concentration (duplicate sample/MSD)

Comments: Gross α RPD 33% for Water Sample (Limit 20%)

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10. FIELD QC SAMPLES

Field blank(s) identified? . . . . . Yes No N/A

Field blank results acceptable? . . . . . Yes No N/A

Analytes detected in field blank(s)? . . . . . Yes No N/A

Field duplicate sample(s) identified? . . . . . Yes No N/A

Field duplicate RPD values acceptable? . . . . . Yes No N/A

Field split sample(s) identified? . . . . . Yes No N/A

Field split RPD values acceptable? . . . . . Yes No N/A

Performance audit sample(s) identified? . . . . . Yes No N/A

Performance audit sample results acceptable? . . . . . Yes No N/A

Comments:

11. DETECTION LIMITS (LEVELS D & E)

MDA's meet required detection limits? . . . . . Yes No N/A

Transcription/calculation errors? . . . . . Yes No N/A

★

Minimum Detectable Activity (MDA)

$$\frac{4.66 \times \sqrt{(B.2)(T.2)}}{2.22(E.2)(I.2)(R.2)(D.2)(V.2)(Y.2)(T.2)}$$

where:

- B.2 = background counts per minute (cpm) or the reported standard deviation of the background (S) cpm
- T.2 = counting time for associated sample
- 2.22 = conversion dpm/pCi
- E.2 = detector efficiency
- I.2 = ingrowth correction factor (if applicable or 1)
- R.2 = carrier recovery factor (if applicable or 1)
- D.2 = decay factor (if applicable or 1)
- Y.2 = chemical yield factor (if applicable or 1)
- V.2 = sample volume in liters or grams

Comments: MDA's not met for U233/4 & U238 No qualifiers needed MDA for UTOTAL not met No qualifiers needed

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Results Calculation Equations

Gross α/β and Tritium

$$\frac{(A.3 - B.3) \times C.3}{(2.22)(E.3)(V.3)}$$

where:

A.3 = gross counts per minute
B.3 = background counts per minute
C.3 = activity of α fraction in β channel*
2.22 = conversion factor, dpm/pCi
E.3 = detector efficiency
V.3 = sample volume, liters or grams
*if for calculation of gross β, otherwise substitute 1

Strontium (total)

$$\frac{A.4 - B.4}{(2.22)(E.4)(I.4)(D.4)(R.4)(V.4)}$$

where:

A.4 = gross counts per minute
B.4 = background counts per minute
2.22 = conversion factor, dpm/pCi
E.4 = detector efficiency
I.4 = ingrowth correction factor
R.4 = carrier recovery factor
D.4 = strontium decay factor
V.4 = sample volume, liters or grams

Strontium-90 (corrected for Sr-89)

$$\frac{A.5 - B.5}{(2.22)(Y.5)(E.5)(I.5)(D.5)(R.5)(V.5)}$$

where:

A.5 = gross counts per minute
B.5 = background counts per minute
Y.5 = yttrium-90 yield factor
2.22 = conversion factor, dpm/pCi
E.5 = detector efficiency
I.5 = ingrowth correction factor
R.5 = strontium-89 yield factor
D.5 = strontium decay factor
V.5 = sample volume, liters or grams

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Results Calculation Equations, continued

Technetium-99

$$\frac{A.6 - B.6}{(2.22)(E.6)(R.6)(V.6)}$$

where:

A.6 = gross counts per minute
B.6 = background counts per minute
2.22 = conversion factor, dpm/pCi
E.6 = detector efficiency
R.6 = carrier recovery factor
V.6 = sample volume, liters or grams

Alpha Spec Isotopes

$$\frac{A.7 - B.7}{(2.22)(E.7)(R.7)(V.7)}$$

where:

A.7 = gross counts per minute for isotope
B.7 = background counts per minute for detector
2.22 = conversion factor, dpm/pCi
E.7 = detector efficiency
R.7 = tracer recovery factor
V.7 = sample amount, liters or grams

Gamma Spec Isotopes

$$\frac{A.8}{(2.22)(B.8)(D.8)(E.8)(V.8)(T.8)}$$

where:

A.8 = peak area for isotope
D.8 = decay factor for isotope
2.22 = conversion factor, dpm/pCi
B.8 = abundance factor for isotope
E.8 = efficiency factor for isotope
V.8 = sample amount, liters or grams
T.8 = live time (minutes)

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Results Calculation Equations, continued

Total Uranium by Laser Fluorometry

$$\frac{(W.9 - I.9)(R.9)(D.9)}{U.9 - W.9}$$

where:

W.9 = sample reading with Fluran
I.9 = initial sample reading
R.9 = concentration of uranium standard after dilution with sample (µg/L)
D.9 = dilution factor
U.9 = sample reading with uranium standard

Radium-226 by Radon Emanation

$$D = \frac{COUNT}{(2.22)(CAL)(VOL)} \times \frac{1}{1 - e^{-\lambda t_1}} \times \frac{1}{e^{-\lambda t_2}} \times \frac{t_3}{1 - e^{-\lambda t_3}}$$

where:

COUNT = net count rate, cpm
CAL = calibration constant of the de-emanation system and the scintillation cell in counts per minutes/disintigrations per minute of radon-222
VOL = sample aliquot in liters
t_1 = the elapsed time in days between the first and second de-emanations, and λ is the decay constant for radon-222 (0.181 d^{-1})
t_2 = the time interval in hours between the second de-emanation and counting, and λ is the decay constant of radon-222 (0.00755hr^{-1})
t_3 = the counting time in minutes, and λ is the decay constant of radon-222 (1.26×10^{-4} min^{-1})
2.22 = conversion factor, dpm/pCi

BH 8/1/94

9613503.0509

RADIOCHEMICAL SAMPLE WORKSHEET

Validator: MWebb	Date: 9-18-94	SDG: BOBKJ7 - TMA - 744
Laboratory: TMA	Sample ID: BOBKJ7	CASE: N4-04-044-7361

Nuclide	CDATE	DET	BKG	EFF	BLK	LCS %	DUP RPD	Y/R2	RESULT	MDA	CRDL W/S	Q
Gross α	132	6AW 102	✓	✓	✓	75	33	NA	346	1.9	3/10	J (RPD)
Gross ß	132	6RB 102	✓	✓	✓	78.5	0	NA	176	2.0	4/15	none
Ra-226											2/-	
Ra-228											3/-	
Ra-Total											1/5	
Ra-Deem											1/-	
Sr-89											5/1	
Sr-90	✓	✓	✓	✓	✓	99	118	.783	.21(U)	.7	2/1	none
LSC (H_3)											400/s	
GEA											varies	
Am-241											1/1	
Cm-244											1/1	
Pu-238											1/1	
Pu-239/40											1/1	
Pu-241											15/5	
U-233/34	126	SS 27	✓	X	✓	96	15	.8419	182	.9	.2 1/1	J (eff)
U-235/36	↓	↓	✓	X	✓	94	7	↓	13.6	.2	.2 1/1	J ↓
U-238	↓	↓	✓	X	✓	82	15	↓	184	.8	.2 1/1	J ↓
U-Total	5-6-94	KPA	NA	NA	✓	102	0	NA	610	4	1/1	µg/L
U-Fluoro											0.1	
Np-237											1/1	
Tc-99	✓	✓	✓	✓	✓	95	16	.3811	29.1	2.3	15/5	none
I-129											5/2	

O=OK S=same X=Minor Def. M=Major Def. Q=Sample Qualifier

PNO-DVF-015, R1

LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION SUMMARY

BOBKJ7 TMA744

MAJOR DEFICIENCIES:

MINOR DEFICIENCIES:

1. Gross alpha RPD > 20%. Result is qualified as estimated (J)

2. The detector efficiency had not been checked within 7 days of analysis for the α spec. analysis. The U238, U235, U233/4 results are qualified as estimated (J)

COMMENTS:

MDA were not met for U isotopic and U total analysis. NO qualifiers needed.

BH 8/1/94

PRECISION DATA SUMMARY

SDG: BOBKJ7 TMA 744	VALIDATOR: MWebb	DATE: 7-18-94	PAGE 1 OF 1

COMMENTS: INORGANIC ANALYSES

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Alpha	346	253	4133	BOBKJ7	J

PNO-DVF-014, R1

00033

150.3505.95

9613503.0512

DATA QUALIFICATION SUMMARY

SDG: BOBKJ7 TMA 744	VALIDATOR: MWPGB	DATE: 7-18-94	PAGE 1 OF 1
COMMENTS: GENERAL GC			

COMPOUND	CAS No.	QUALIFIER	SAMPLES AFFECTED	MEDIA	REASON
Alpha	Alpha	J	BOBKJ7	W	RPD > 20%
U 233/234		J	BOBKJ7		eff > 7 days old
U 235	~~HS~~ 15117-96-1	J			
U 238	~~15117-96-1~~	J			

PNO-DVF-017, R1

000004

09-MAY-94
11:48:25
N404044
NV

9613503.0513

TMA Corporation
Alpha Spectroscopy
ASPEC V 4.01

7361- 1 U
BOBKJ7

Reviewed AA Date 5/9
AV5/14

Counted on SS 27
GMT 126.276 94
Zero time 98.292 94

685.65 minutes

Dirty Plate

GMT of std 115.902 94
Sep. time 0.000 0 eff

****
** RECALCULATED DATA **
****

Chemical yield 0.8419

Tracer - U 232 (F-H1-A-(7) 319.158-92)

10.58 Dpm X 0.9859 = 10.43 Corr. tracer DPM

Channels 109-133
Bkg CPM 0.00568 (on 113.942 94 for 2464.70 Min.

Gross cnts 212
Background 4
Net counts 208 7.2% FWHM Of tracer = 89. KeV

Divisor 1.9941E+01 (net counts / corr. tracer DPM)
Det. Eff 0.0345
Yield 0.8419 (net counts) / (eff. x corr. tracer DPM X time)

	U 238		U 235		U 233/x		U 234	
Channels	23- 43*		44- 67*		69- 99		76- 93	
Bkg CPM	0.00081		0.00122		0.00325		0.00243	
Gross cnts	8182		499		8107		7341	
Background	1		1		2		2	
Tracer cts	0	0	0	0	0	0	0	0
U235 cnts	50		0		55		0	
Net counts	8131	91	498	22	8050	90	7339	86
Lambda	(4.2266E-13)		(2.6729E-12)		(1.1714E-08)		(7.6520E-09)	
Decay corr	1.0000		1.0000		1.0000		1.0000	
Brnch ratio	1.0000		0.8260		1.0000		1.0000	
DPM of aliq	4.0776E+02		3.0235E+01		4.0370E+02		3.6804E+02	
Aliquot	1.0000E+00		1.0000E+00		1.0000E+00		1.0000E+00	
Dpm/l	4.0776E+02		3.0235E+01		4.0370E+02		3.6804E+02	
pCi /l	1.837E+02		1.362E+01		1.818E+02		1.658E+02	
1 sigma Err	7.3%		8.5%		7.3%		7.3%	
pCi Err	1.340E+01		1.152E+00		1.327E+01		1.211E+01	
2 sigma Err	14.6%		16.9%		14.6%		14.6%	
pCi Err	2.681E+01		2.304E+00		2.654E+01		2.422E+01	
Limitng Vlu	< 2.06E+02		< 1.55E+01		< 2.04E+02		< 1.86E+02	
MDA	8.18E-01		2.09E-01		8.61E-01		2.16E-01	

9613503.0514

CALCULATION SUMMARY

SDG: BOB KJ7 TMA 74	VALIDATOR: MWebb	DATE: 7/18/94	PAGE 1 OF 6

COMMENTS: RADIOCHEMICAL ANALYSES

✓ Tc 99 yield = (pCi/L at T Zero) / Std Average
= 8015.3 / 21032.8 = .3811

Result (Adj CPM) / (d)(y)(vol)(2.22)(eff)
Result = (2.10) / (1)(.3811)(.2)(2.22)(.4274)
= 29.04 pCi/L 29.07 reported OK

MDA = (4.66 √(.57)(508.7)) / (2.22)(d)(vol)(eff)(y)(aT)
= (4.66 √(289.555)) / (2.22)(1)(.2)(.4274)(.3811)(508.7)
= 2.23 2.32 reported OK

Spike 48.482 / 51.04 = ~~.4033~~ .945
(found / expected) 100 = %
.945 * 100 = 94.5 % R OK

Dup. Dresult = 34.16 Orig Result = 29.07

RPD = (5.09 / 31.615) 100 = 16.1% OK

U 150 Tracer recovery = (Net cts) / (Trace DPM)(eff)
= (208 / 685.65) / (.0345)(10.43)
= .843 OK

U 238 = (Net cts) / (eff)(y)(br.)(d)(2.22)(T)
= (8131) / (.0345)(.8415)(1)(1)(2.22)(685.65)
= 183.5 (183.7 reported) OK

U 235 = (498) / (.0345)(.8415)(1)(.8260)(2.22)(685.65)
= ~~13.66~~ (13.62 reported) OK
13.64 OK
MW
7-18-94

PNO-DVF-015, R1

000036

CALCULATION SUMMARY

SDG: BUBKJ7 TMA 744	VALIDATOR: Mulebb	DATE: 7/18/94	PAGE 2 OF 6

COMMENTS: RADIOCHEMICAL ANALYSES

✓ U TOTAL

$$MDA = \frac{(blank)(D.F)(Vol)}{Vol}$$

$$= \frac{(.044)(100)(.02)}{.02} = 4.4 \quad OK$$

U TOTAL result = (read)(Dyield)

$= (611.75) = (6.1175)(100)$

$$MS = \frac{\text{Spike read} - \text{Unspiked read}}{\text{exp}} \times 100$$

$$\frac{8.10181 - 6.1175}{1.952} \times 100 = 101\%$$

Spike (found/exp) 100 = % recovery.

$(.6632/.6506)100 = 101.9\%$ OK

Dup. Orig SA 611.75 Dup SA = 609.374

$$RPD = \frac{|611.75 - 609.374|}{\frac{611.75 + 609.374}{2}} \times 100$$

$$= (2.376/610.52)100 = .39\%$$

CALCULATION SUMMARY

SDG: BOBKJ7 TMH 744	VALIDATOR: MWebb	DATE: 7/18/96	PAGE 2 OF 6

COMMENTS: RADIOCHEMICAL ANALYSES

Gross Alpha, Beta

α

Result (~~Tumbles~~ Adj CPM)/(eff)(vol)(2.2)

= (24.449)/(.106)(.3)(2.22) = 346 (α)

Bresult (48.603)/(.413)(.3)(2.22) = 176 (β)

MDA = [4.65 √(BKG)(CT) +3]/(2.22)(eff)(vol)(CT)

MDA α = (4.65 √(.05)100 +3)/2.22 (.106)(.3)(100)

= 1.92

MDA β = (4.65 √(1.308)(100 +3)/(2.22)(.413)(.3)(100)

= 2.04

Spike (α) 16.8/22.4 = .75 *100 = 75% (found/exp) 100 = % Recovery

Spike (β) 18.3/23.3 = .785*100 = 78.5%

	(orig)	dup.	RPD	RPD = $\frac{(O-D)}{(O+D)/2}$ x100 = RPD
Dup. (α)	346	253	93/~~256.5~~	.31*100 = 31%
Dup (β)	176	178	2/177 x100 =	1.1%

Sr 90 y = 11.89/15.15 = .7828

Result = (Y CPM)/(eff)(V)(d)(y)(2.22)

= (.194)/(.5379)(1)(.5583)(.7828)(2.22)

= .208

MDA = [4.65 √(.3570)(33) +3]/(2.22)(eff)(Vol)(d)(y)(CT)

= .611 (.6869 reported)

9613503.0517

CALCULATION SUMMARY

SDG: BOBKJ7 TMA 744	VALIDATOR: MWebb	DATE: 7/18/94	PAGE 4 OF 6

COMMENTS: RADIOCHEMICAL ANALYSES

Sr 90

Spike (found/exp) * 100 = % recovery

(11.511/11.66) 100 = 98.7%

Dup: O = .4 .208 D = .807 both U No calc |O-D| < CRDL

Sr 89

NOT required

CALCULATION SUMMARY

SDG: BOBKJ7 TMA 744	VALIDATOR: MWebb	DATE: 7/18/94	PAGE 5 OF 6

COMMENTS: RADIOCHEMICAL ANALYSES

U 233/234 Results

U233/4 = (8050)/(.0345)(.8419)(1)(1)(2.22)(685.65)

= 182.1 (181.8 reported) ok

MDA = [4.66 √BKG CT]/(eff)(2.22)(yield)(branch) CT (decay)

U238 = 4.66 √(.00081)(685.65) / (eff)(d)(b)(y)(2.22)(CT)

U235 [4.65 √(BKG × CT) + 3]/(eff)(2.22)(br)(y)(CT)(vol)(d)

= [4.65 ((.00122)(685.65))^1/2 + 3]/(2.22)(.8419)(.82600)(1)(1)(685.65)(.0

= .199 (.209 reported) ok

U238 = [4.65 ((.00081)(685.65))^1/2 + 3]/(2.22)(.8419)(1)(1)(1)(685.65)(.0345

= ~~.7207~~ (.818 reported)

= .146 (.818 reported)

U233/234 = [4.65 ((.00325)(685.65))^1/2 + 3]/(2.22)(.8419)(1)(1)(1)(685.65)(.0345

= .2248 (.861 reported)

MDA calculated < MDA reported No qualifier

CALCULATION SUMMARY

SDG: BOBKJ7 TMA 744	VALIDATOR: MWebb	DATE: 7/18/94	PAGE 6 OF 6

COMMENTS: RADIOCHEMICAL ANALYSES

%R = (found / expected) 100

U 233/234 spike (4.70/4.86) 100 = 97%

U 235 spike (3.5/3.72) 100 = 94%

U 238 spike (4.0/4.83) 100 = 83%

Duplicate RPD = $\frac{|D-D|}{\left(\frac{D+D}{2}\right)} \times 100 = RPD$

U 233/234	D = 210	D = 180	RPD = 15%
U 235	D = 15	D = 14	RPD = 7%
U 238	D = 210	D = 180	RPD = 15%

9613503.0520

N404044-04

TMA NORCAL

SAMPLE DELIVERY GROUP 7361

DUPLICATE

B0BKJ7

Case/SDG	94-088/7361			Client	Westinghouse Hanford
Contact	N. Joseph Verville			Contract	MBH-SVV-069262
	DUPLICATE		ORIGINAL		
Lab sample id	N404044-04	Lab sample id	N404044-01	Client sample id	B0BKJ7
Dept sample id	7361-004	Dept sample id	7361-001	Location/Matrix	200-UP-1 LIQUID
		Received	04/13/94	Collected	04/08/94
				Chain of custody id	EFL-1124

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	250	12	2	3		80A	350	14	2		33	44	
Gross Beta	180	5.5	2	4		80B	180	5.5	2		0	33	
Strontium 90	0.81	0.97	0.8	2	J	Y	0.21	1.2	0.7	U	118	454	
Technetium 99	34	1.8	2	5		TC	29	1.8	2		16	25	
Uranium 233/234	210	33	1	0.2		U	180	27	0.9		15	35	
Uranium 235	15	2.8	0.3	0.2		U	14	2.3	0.2		7	39	
Uranium 238	210	33	1	0.2		U	180	27	0.8		15	35	
Total Uranium (ug/L)	610	120	4	0.1	X	U_T	610	120	4		0	46	

QC 18926-18930 REP #1

MW
7-18-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DUP
Version	2.30
Report date	05/20/94

9613503.0521

Laboratory Case Narratives

CASE NARRATIVE

LABORATORY : TMA/ARLI

CASE : 04-035

CONTRACT ID : WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE : April 13, 1994

1.0 DESCRIPTION OF CASE :

Two water samples were analyzed for TCL Organics- Volatiles and Pesticides/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	pH
B0BKJ7	A4-04-035-01A	V	WATER	0
B0BKJ7	A4-04-035-01B	P	WATER	
B0BKJ7 MS	A4-04-035-01C	P	WATER	
B0BKJ7 MSD	A4-04-035-01D	P	WATER	
B0BKJ8	A4-04-035-02A	V	WATER	0
B0BKJ8 MS	A4-04-035-02B	V	WATER	0
B0BKJ8 MSD	A4-04-035-02C	V	WATER	0

3.0 COMMENTS :

3.1 SHIPPING AND DOCUMENTATION :

All of the samples were received unbroken and properly documented.

3.2 ANALYSIS

3.2.1 VOLATILE ANALYSIS COMMENTS :

LOW LEVEL WATER :

The samples were analyzed within the CLP SOW holding times.

The TCL analyte, Carbon Tetrachloride, was detected in sample B0BKJ7, at a relatively high concentration.

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

TUNES :

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

3.2.2 PESTICIDE/PCB ANALYSIS COMMENTS :

SEQUENCE NOTES :

The sequence was started on 04/20/94 and was analyzed according to the USEPA CLP SOW. The sequence was analyzed by single injection into a dual column system.

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

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

SAMPLE NOTES :

LOW LEVEL WATER :

The samples were extracted and analyzed within the CLP SOW holding times. The TCX and DCB surrogate recoveries in all of the samples were within the advisory QC limits. No TCL analytes were detected in the samples.

Both the MS and MSD samples were inadvertently spiked with the multiresponse analyte, Aroclor-1254, instead of the Pesticide spiking analytes. Therefore, the matrix spike summary form exhibits no recoveries for the Pesticide spiking compounds. Since there was a limited sample volume, a reextraction for the matrix spike samples was not feasible, and the Aroclor-1254 spiking recoveries were reported. The MS and MSD samples were spiked with 2.0 ug/L of Aroclor-1254, with an 85% recovery in the MS, and a 80% recovery in the MSD sample.

All of the QC results were within the limits specified by 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 6/6/94
Nicole Roth
CLP Program Manager

Maureen Parrish 6/3/94
Maureen Parrish
Program Manager

GENERAL CHEMISTRY RESULTS

CASE NO. 04-035

Sample #s:

B0BKJ7 B0BKJ8

CASE NARRATIVE

Sample B0BKJ7 (A4-04-035-01G) yielded a 22.2% RPD for the Fluoride analysis. The results are considered valid based on the very low concentration relative to the difference between the sample and duplicate.

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

Maureen Parrish 6/3/94

Maureen Parrish

TMA/Norcal

Report N4-04-044-7361
Sample Delivery Group 7361

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

Case Narrative

May 20, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7361 is comprised of one water sample designated as SAF #94-088, delivered under Field Logbook No. EFL-1124. Unique identifiers were not listed on the Chain-of-Custody documents. Two 4 L poly bottles containing the sample was received for analysis.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

The gross alpha recovery for the LCS was 75% which is outside the Hanford data validation guidelines of 80-120% but within the 3σ total protocol limits of 74-126%.

2.2 Gross Beta Analyses

The gross beta recovery for the LCS was 79%, just outside both the Hanford data validation guidelines and the 3σ total protocol limits of 80-120%. Since the result for the reagent blank was negative, and the result of the duplicate analysis was a very good match to the result of the original analysis the samples were not realiquoted.

2.3 Strontium-90 analyses

No problems were encountered by the laboratory with the analyses.

2.4 Technetium-99 Analyses

No problems were encountered by the laboratory with the analyses.

2.5 Uranium-233, 234/235, and 238 Analyses

Due to high uranium activity, sample B0BKJ7 and the duplicate of sample B0BKJ7 were counted on a low efficiency detector for better peak resolution. As a result the low counter efficiency caused the MDA's to increase above the RDL. The higher MDA's are not a problem since the activity of the samples is so much greater than the RDL. The MDA's for uranium-233/234, and 238 in the lab control sample were greater than the RDL, however the activity of the lab control sample is so much greater than the RDL that the high MDA is not considered a problem. The reagent blank contained uranium activity but at such a low level relative to the sample activity that the quality of the analyses is not compromised.

2.6 Total Uranium Analyses

The MDA's for sample B0BKJ7, the duplicate of sample B0BKJ7, and the laboratory control sample were greater than the RDL due to dilutions performed on the samples in order to achieve a response from the laser phosphorimeter (KPA) within the calibration range. Sample B0BKJ7 contained uranium at a level much greater than the RDL therefore the high MDA is not considered a problem.

9613503.0527

Chain-of-Custody Information

9613503.0528

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 200-UP-1

Collection Date 04/8/94

Ice Chest No. #4

Field Logbook No. EFL-1124

Bill of Lading/Airbill No. 1402137385

Offsite Property No. W99-0-0336-3

Method of Shipment EMERY

Shipped to ~~TT~~ TMA KT 3/25/94

Possible Sample Hazards/Remarks NONE DETECTED

Sample Identification

BOBK J7
- ✓✓✓3; 40mL; Gs; WATER; VOA (HCl)
- ✓✓✓ 3; 1L; aG; WATER; PCB/PEST
- ✓1; 500mL; G; WATER; ANIONS (IC)-NO3
- ✓ 1; 500mL; P; WATER; NO3 (H2SO4)
- ✓✓ 2; 4L; P; WATER; TOTAL URANIUM, U-234/235/238, GROSS ALPHA/BETA, Sr-90 (HNO3)
- ✓ 1; 1L; P; WATER; Tc-99 (HCl)

BOBK J8
- ✓✓✓ 3; 40mL; Gs; WATER; VOA (HCl)

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

Relinquished By	Date	Time	Received By	Date	Time
B. WHITTEN	4/8/94	1130	L Sweeney	4-8-94	1130
L Sweeney	4-12-94	1000	Kermit Blum K. Blum	4-13-94	1200

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:
Data Deliverable-Standalone samples stored in frig. #3A by K.D. Lee 04/08/94

A-6000-407 (12/92) WEF061

9613503.0529

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. O. Lee Date Sampled 04/8/94 Time 0911 hours

Company Contact P. H. Butcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B0BK	3; 40mL; Gs	WATER	VOA (HCl)
	3; 1L; aG	WATER	PCB/PEST
	1; 500mL; G	WATER	ANIONS (IC)-NO3
	1; 500mL; P	WATER	NO3 (H2SO4)
	2; 4L; P	WATER	TOTAL U, U-234/235/238, GROSS ALPHA/BETA,
			Sr-90 (HNO3)
	1; 1L; P	WATER	Tc-99 (HCl)
B0BK	3; 40mL; P	WATER	VOA (HCl)
			OPC: W94-0-0336-32
			BOL: 1402137385
			SAF: 94-088

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

00 42

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406(05/90)

000111

9613503.0530

VEDD Printout

000112

VALIDATION ELECTRONIC DELIVERABLE B0BKJ7-TMA-744

Thursday, July 28, 1994

HEIS-SN	Form	FormNr	LabCode	ConstID	Media	Value	ConcFlag	Qual	CountErr	Units
B0BKJ7	NCLP	NA	TMA	309-00-2	SW			UJ		
B0BKJ7	NCLP	NA	TMA	319-84-6	SW			UJ		
B0BKJ7	NCLP	NA	TMA	319-85-7	SW			UJ		
B0BKJ7	NCLP	NA	TMA	319-86-8	SW			UJ		
B0BKJ7	NCLP	NA	TMA	58-89-9	SW			UJ		
B0BKJ7	NCLP	NA	TMA	5103-71-9	SW			UJ		
B0BKJ7	NCLP	NA	TMA	5103-74-2	SW			UJ		
B0BKJ7	NCLP	NA	TMA	72-54-8	SW			UJ		
B0BKJ7	NCLP	NA	TMA	72-55-9	SW			UJ		
B0BKJ7	NCLP	NA	TMA	50-29-3	SW			UJ		
B0BKJ7	NCLP	NA	TMA	60-57-1	SW			UJ		
B0BKJ7	NCLP	NA	TMA	959-98-8	SW			UJ		
B0BKJ7	NCLP	NA	TMA	33213-65-9	SW			UJ		
B0BKJ7	NCLP	NA	TMA	1031-07-8	SW			UJ		
B0BKJ7	NCLP	NA	TMA	72-20-8	SW			UJ		
B0BKJ7	NCLP	NA	TMA	76-44-8	SW			UJ		
B0BKJ7	NCLP	NA	TMA	1024-57-3	SW			UJ		
B0BKJ7	NCLP	NA	TMA	72-43-5	SW			UJ		
B0BKJ7	NCLP	NA	TMA	53494-70-5	SW			UJ		
B0BKJ7	NCLP	NA	TMA	16984-48-8	SW			J		
B0BKJ7	NCLP	NA	TMA	ALPHA	SW			J		
B0BKJ7	NCLP	NA	TMA	15117-96-1	SW			J		
B0BKJ7	NCLP	NA	TMA	75-09-2	SW			U		
B0BKJ8	NCLP	NA	TMA	67-64-1	SW			U		
B0BKJ7	NCLP	NA	TMA	U233/234	SW			J		
B0BKJ7	NCLP	NA	TMA	U238	SW			J		
B0BKJ7	NCLP	NA	TMA	N02-N	SW			UR		
B0BKJ7	NCLP	NA	TMA	N03-N	SW			J		
B0BKJ7	NCLP	NA	TMA	14265-44-2	SW			UR		
B0BKJ7	NCLP	NA	TMA	7421-36-3	SW			UJ		

Entered by: D.H. 7/28/94

Checked by: BH 7/28/94