START 9613474.1195

0000001

W0004-ITC-022

0045192

Analytical Data Package Prepared for

WESTINGHOUSE HANFORD

MAY 1994
RECEIVED
SDLA

Chemical Analysis By

IT Analytical Services
Middlebrook Laboratory

Sample Delivery Group Number: W0004

WHC IDENTIFICATION NUMBER	ITAS RICHLAND ID NUMBER	KNOXVILLE ID NUMBER

*-See attached Table I.

RECORD COPY

9613474.1196

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-94-0069
Record of Disposition No.

DATE: March 28, 1994	LABORATORY: IT
PROJECT TITLE/NO.: 200-UP-1/SAF 94-046 and 94-045	NCR NO.: n/a

SAMPLE IDENTIFICATION NUMBERS: B0BHZ5, B0BHZ6, B0BHZ7, B0BJ00, B0BHZ8, B0BHZ9

DESCRIPTION OF EVENT:

Due to oversight by the sampler, SAF identification numbers documented on chain of custody (COC) documentation and sample labels are inconsistent with the sample material received by IT. Soil samples received by IT on 3/10/94 reference SAF 94-045 (perched water) on both the COC form and sample label. Soil samples received on 3/18/94 reference SAF 94-045 on the COC form and SAF 94-046 (soil) on the sample labels.

DISPOSITION OF SAMPLES:

The correct SAF # associated with the listed samples is 94-046. IT is directed to proceed with analysis and note the inconsistency in the Case Narrative for the associated delivery group.

APPROVAL SIGNATURES:

J. A. Lerch Jeff Lerch — 3/28/94
CAS Project Coordinator (Print/Sign Name) — Date

B. E. Innis Brian E. Innis — 3/29/94
Technical Representative (Print/Sign Name) — Date

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

9613474.1197

IT/WHC ISSUE RESOLUTION FORM

SAF No. 94-045/94-046 Project 200-UP-1 Perched H_2O / 200-UP-1 Soil Date 3/23/94

Sample No.(s) B0BH75, B0BH76, B0BH77, B0B500, B0BH78, B0BH79

Submitted By: Jim Harvey

Phone No. 615-690-3211 x5611

Fax No. 615-693-2348

Submitted To: Jeff Larch

Phone No. 509-372-2596

Fax No. 509-372-2106

ISSUE	PROPOSED RESOLUTION
IT recv'd Soil Samples on 3/10/94 where both COC & bottles reference SAF 94-045. Samples recv'd on 3/18/94 have SAF 94-045 on COC and 94-046 on bottles. Requested analytical suite on COCs is from 94-046.	WHC to notify which SAF # is correct. LER

IT/WHC0001

9613474.1198

INTERNATIONAL TECHNOLOGY CORPORATION

To: Rich Weiss

Company: Westinghouse Hanford Company

From: Van Pettey / Suzanne Gaines

Re: COCs For WHC Samples Submitted Under SAF 94-045 (Should have been SAF 94-046). The Sample Numbers Are Listed On These COCs.

Date: March 23, 1994

Fax No: 372-2106

Number of Pages (including cover sheet): 4

If you do not receive all pages, please contact us immediately:

Our Telephone Number: (509) 375-3131

Our FAX Number: (509) 375-5590

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W49-35	SAF No.: ~~94-045~~ 045 WJS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 403375

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	COOL 4	
Type of Container	aGS	aG	G	P/G	G	P/G	P/G	P/G					aGS	aGS	
No. of Container(s)	1	1	1	1	1	1	1	1					1	1	
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml	
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)	VOA (Field)	
	A	B	C	D	E	F									

	Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F								
01	BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X						
02	BOBJ00	S	3-16-94	0915												X		
03	BOBHZ9	S	3-16-94	1340													X	
04	BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 3-18-94 1200	Received By: R. Boyd	Date/Time: 3/18/94 1210
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1: GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-17-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

Matrix*
- S = Soil
- SE = Sediment
- SO = Solid
- SL = Sludge
- W = Water
- O = Oil
- A = Air
- DS = Drum Soli
- DL = Drum Liqu
- T = Tissue
- WI = Wipe
- L = Liquid
- V = Vegetatio
- X = Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/5

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: WA4-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS																
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGS	aG	G	P/G	G	P/G	P/G	P/G					aGS		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		

Sample No.	Matrix*	Date Sampled	Time Sampled														
B0BHZ5	S	3-7-94	1315	X	X	X	X	X	X	X	X						
40321901AF																	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1340 3-10-94	Received By: Heidelberg	Date/Time: 3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

H0322001-Rad.

SDL W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

S	=	Soil
SE	=	Sediment
SO	=	Solid
SL	=	Sludge
W	=	Water
O	=	Oil
A	=	Air
DS	=	Drum Solid
DL	=	Drum Liqui
T	=	Tissue
WI	=	Wipe
L	=	Liquid
V	=	Vegetation
X	=	Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/9

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SME-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 # 14	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: NONE OBSERVED	Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE	

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP)	SEMI VOA (CLP)	ICP MTLS GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-1, CL SO4, NO2 NO3, PO4	NO2, NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container				aGS	aG	G	P/G	G	P/G	P/G	P/G					aGS		
No of Container(s)				1	1	1	1	1	1	1	1					1		
Volume				120ml	500ml	500ml	250ml	250ml	125ml	1000ml	500ml					40ml		
BOBH26	S	3-8-94	1405	X	X	X	X	X	X	X	X							
40321962A-F																		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	W. V. Setzer	3-8-94 1526	R. J. Stull	3/8/94 1526
Relinquished By	R. J. Stull	3/9/94 0905	W. V. Setzer	3/9/94 0906
Relinquished By	W. V. Setzer	3/10/94 1540	Wardelke	3/10 1543
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RE-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TC INCLUDE: Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322002 - Red. SDG W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*: S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air; DS = Drum Solids; DL = Drum Liquids; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6030-828 (12/92)

9613474.1201

9613474.1202

0000001

INTERNATIONAL TECHNOLOGY CORPORATION

RECORD COPY

MAY 1994
RECEIVED
SDLA
DFL 5-24-94

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

Dear J.A. Lerch

Thank you for purchasing analytical testing services from IT Corporation. It is our intention to supply our clients with data packages which not only meet the industry's highest standards for quality, but are also easy to use. Features which we point out are:

1. A Data Summary Packet which allows you to review your data without searching through the complete data package.

   Your Data Summary Packet contains the following items:

   - Case Narrative: listing of sample identifications, analyses performed, explanation of any problem associated with samples, corrective action taken.
   - Quality control sample identifications and analyses performed.
   - Data summary.

2. A data package which meets the specific requirements you requested and is easy to use as well. The package is organized in accordance with the Table of Contents which you will find at the beginning of each section. Sections are separated by color-coded tabs, making it easy to find individual analytical parameters which may be of particular interest to you. The data package is custody-sealed at the laboratory - your assurance that parts of the package are not missing.

We are constantly searching for ways to improve our service to you. This current product has many of the features which you have told us are important to you. Your suggestions regarding additional improvements will be appreciated.

Please contact me with any questions or suggestions.

RECORD COPY

Sincerely,

Sheree' Schneider
Project Manager

Regional Office
5815 Middlebrook Pike ▪ Knoxville, Tennessee 37921 ▪ 615-588-6401

IT Corporation is a wholly owned subsidiary of International Technology Corporation

9613474.1203

0000001A

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 22 , 1994

MAY 1994
RECEIVED
SDLA
DFA 5-24-94

Job Number: 204 & 234

This is the Certificate of Analysis for the following samples:

SDG:	W0004
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	03/12/94 & 03/19/94
Number of Samples:	Seven (7)
Sample Type:	Soil - six (6), Water - one (1)

I. Introduction

On March 12 and March 19, 1994, six (6) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

RECORD COPY

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

III. Quality Control

The volatile analyses were performed March 14-15, March 23 and March 26, 1994 by purge and trap with a J & W DB-624 column on Hewlett-Packard 5970 and Finnigan INCOS 500 GC/MS/DS units. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

The semivolatile analyses were performed March 29-30 and April 5-6, 1994 by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS unit. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

The samples were digested on April 1, 1994 for ICP and March 31, 1994 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on April 1, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from March 31 through April 2, 1994; the remaining metals were analyzed by ICP on April 2, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBHZ5. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for antimony by ICP analysis and selenium by GFAA analysis. A post digestion spike was performed for antimony as required by CLP protocol. As the lead and titanium concentrations were greater than four times (4X) the spike added, spiking criteria did not apply for these analytes. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses. MSAs were performed as required by CLP protocol.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

On March 29, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C). Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

The samples were analyzed for anions from March 26 through April 2, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Matrix	Test
AA3763	4-03-219-01A	BOBHZ5	SOIL	VOC
AA3764	4-03-219-01B	BOBHZ5	SOIL	SVOC
AA3765	4-03-219-01C	BOBHZ5	SOIL	METALS
AA3766	4-03-219-01D	BOBHZ5	SOIL	CN
AA3767	4-03-219-01E	BOBHZ5	SOIL	ANIONS
AA3768	4-03-219-01F	BOBHZ5	SOIL	NO3NO2
AA3769	4-03-219-02A	BOBHZ6	SOIL	VOC
AA3770	4-03-219-02B	BOBHZ6	SOIL	SVOC
AA3771	4-03-219-02C	BOBHZ6	SOIL	METALS
AA3772	4-03-219-02D	BOBHZ6	SOIL	CN
AA3773	4-03-219-02E	BOBHZ6	SOIL	ANIONS
AA3774	4-03-219-02F	BOBHZ6	SOIL	NO3NO2
AA4243	4-03-375-01A	BOBHZ7	SOIL	VOC
AA4244	4-03-375-01B	BOBHZ7	SOIL	SVOC
AA4245	4-03-375-01C	BOBHZ7	SOIL	METALS
AA4246	4-03-375-01D	BOBHZ7	SOIL	CN
AA4247	4-03-375-01E	BOBHZ7	SOIL	ANIONS
AA4248	4-03-375-01F	BOBHZ7	SOIL	NO3NO2
AA4249	4-03-375-02A	BOBJOO	SOIL	VOC
AA4250	4-03-375-03A	BOBHZ9	SOIL	VOC
AA4251	4-03-375-04A	BOBHZ8	SOIL	VOC
AA4252	4-03-375-04B	BOBHZ8	SOIL	SVOC
AA4253	4-03-375-04C	BOBHZ8	SOIL	METALS
AA4254	4-03-375-04D	BOBHZ8	SOIL	CN
AA4255	4-03-375-04E	BOBHZ8	SOIL	ANIONS
AA4256	4-03-375-04F	BOBHZ8	SOIL	NO3NO2
AA4257	4-03-375-05A	Trip Blank	WATER	VOC
AA4257	4-03-375-05B	Trip Blank	WATER	VOC

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

WO#204

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: 4-03-219 DATE INITIATED: 3-11-94

INITIATED BY: Heidelberg

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 3/10 14:50

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
BOBHZ5	na	VOA
		NO_2, NO_3
BOBHZ6	na	VOA
		NO_2, NO_3

Samples were received with the following deficiencies:

- ☐ 1. Not enough sample received for proper analysis.
- ☐ 2. Sample received without proper preservative.
- ☐ 3. No sample received in container.
- ☐ 4. Sample received without a RFA/COC form.
- ☐ 5. No sample ID on container.
- ☐ 6. Sample received broken or leaking.
- ☐ 7. Holding time exceeded at receipt.
- ☐ 8. Custody tape broken.
- ☐ 9. COC not relinquished by client.
- ☒ 10. Sample information on container does not match sample information on the paper work (Explain below).
- ☐ 11. All shipping containers (coolers) on waybill not received with shipment.
  - ☐ RFA/COC received
  - ☐ RFA/COC not received
- ☐ 12. Other (Explain below).

NOTES: Bottles marked as 120 ml - actually were 250 ml.

SUPERVISOR REVIEW: Tami Heidelberg

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN WORK ORDER FILE

FORM NO. LS-023, 3/92, Rev. 0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ5 Bq
~~40321901~~ 9/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3763

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN12

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	5	BJ
75-15-0	Carbon Disulfide	12	U
75-35-4	1,1-Dichloroethene	12	U
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylenes (total)	12	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ5
~~40321901~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3763

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN12

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKANE	18.95	10	J
2.	UNKNOWN ALKANE	21.48	16	J
3.	OCTANE, TRIMETHYL-	21.68	14	JY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ6
~~40321902~~
Bg 9/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3769

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN15

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 9 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ6

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3769

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN15

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 9 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ7
~~40337501~~
Bg 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4243

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4243

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ7

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4243

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4243

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	18	JB

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJOO
~~40337502~~
5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4249

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4249

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJOO

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4249

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4249

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	13	JB

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ9
~~40337503~~
Bg 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4250

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4250

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

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

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ9

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4250

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4250

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	20	JB

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ8
~~40337504~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4251

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4251

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ8

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4251

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4251

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	17	JB

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ5AF
~~40321901AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3764

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA3764

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	920	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	920	U
131-11-3	Dimethylphthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U
99-09-2	3-Nitroaniline	920	U
83-32-9	Acenaphthene	380	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ5AF
~~40321901AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3764

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA3764

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	920	U
100-02-7	4-Nitrophenol	920	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	920	U
534-52-1	4,6-Dinitro-2-Methylphenol	920	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	920	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-Butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
56-55-3	Benzo(a)Anthracene	380	U
218-01-9	Chrysene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ5

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3764

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA3764

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.88	96	AJ
2.	UNKNOWN	3.25	160	AJ
3. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	3.73	7300	ABJN
4.	UNKNOWN	5.47	100	AJ
5.	UNKNOWN PHTHALATE	16.60	130	J
6.	UNKNOWN	23.27	230	J
7.	UNKNOWN	26.82	130	J
8.	UNKNOWN	29.07	1500	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ6AF
~~40321902AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3770

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA3770

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	360	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOB4Z6AF
~~40321902AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3770

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA3770

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	880	U
100-02-7	4-Nitrophenol	880	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	880	U
534-52-1	4,6-Dinitro-2-Methylphenol	880	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	880	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-Butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)Anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)Phthalate	360	U
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BOBHZ6

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3770

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA3770

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	3.23	110	AJ
2. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	3.72	5300	ABJN
3.	UNKNOWN	5.45	77	AJ
4. 74381-40-1	PROPANOIC ACID, 2-METHYL-, 1	13.87	100	JN
5.	UNKNOWN PHTHALATE	16.58	230	J
6.	UNKNOWN	23.25	220	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ7AF
~~40337501AF~~
BB 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4244

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4244

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ7AF
~~40337501AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4244

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4244

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	820	U
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-Methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	340	U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ7

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4244

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4244

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.7

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	4.97	6500	AJN

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZBAF
~~40337504AF~~
bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4252

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA4252

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BH28AF
~~40337504AF~~
BG 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4252

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA4252

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	820	U
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-Methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	340	U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ8

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4252

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA4252

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.87	110	AJ
2. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	4.98	6600	AJN

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBH25
~~0321901~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA3765
Level (low/med): LOW Date Received: 03/12/93
% Solids: 86.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14100			P
7440-36-0	Antimony	11.6	U	N	P
7440-38-2	Arsenic	7.2			F
7440-39-3	Barium	96.0			P
7440-41-7	Beryllium	0.91	B		P
7440-43-9	Cadmium	1.2	U		P
7440-70-2	Calcium	14700			P
7440-47-3	Chromium	19.1			P
7440-48-4	Cobalt	14.5			P
7440-50-8	Copper	22.3			P
7439-89-6	Iron	26800			P
7439-92-1	Lead	19.3		S	F
7439-95-4	Magnesium	8750			P
7439-96-5	Manganese	326			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	17.2			P
7440-09-7	Potassium	2510			P
7782-49-2	Selenium	0.45	U	N	F
7440-22-4	Silver	1.3	B		P
7440-23-5	Sodium	165	B		P
7440-28-0	Thallium	0.45	U		F
7440-62-2	Vanadium	36.6			P
7440-66-6	Zinc	55.8			P
	Titanium	783			P
5955-70-0	Cyanide				NR

Color Before: TAN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1
8
4/12/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBH25
~~0321901~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004

Matrix (soil/water): SOIL Lab Sample ID: AA3766

Level (low/med): LOW Date Received: 03/12/93

% Solids: 86.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.2	U		AS

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

CYANIDE ONLY.

FORM I - IN

ILM02.1

8

4/12/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ6
~~0321902~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA3771
Level (low/med): LOW Date Received: 03/12/93
% Solids: 91.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7160			P
7440-36-0	Antimony	10.8	U	N	P
7440-38-2	Arsenic	2.2			F
7440-39-3	Barium	117			P
7440-41-7	Beryllium	0.44	B		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	80500			P
7440-47-3	Chromium	14.2			P
7440-48-4	Cobalt	10.1	B		P
7440-50-8	Copper	11.0			P
7439-89-6	Iron	18200			P
7439-92-1	Lead	0.44	U		F
7439-95-4	Magnesium	5310			P
7439-96-5	Manganese	342			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	13.0			P
7440-09-7	Potassium	795	B		P
7782-49-2	Selenium	0.44	U	WN	F
7440-22-4	Silver	2.0	B		P
7440-23-5	Sodium	164	B		P
7440-28-0	Thallium	0.44	U		F
7440-62-2	Vanadium	56.2			P
7440-66-6	Zinc	28.2			P
	Titanium	1210			P
5955-70-0	Cyanide				NR

Color Before: TAN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1

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4/12/94

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ6
~~0321902~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA3772
Level (low/med): LOW Date Received: 03/12/93
% Solids: 91.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.1	U		AS

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CYANIDE ONLY.

FORM I - IN

ILM02.1

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4/12/94

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ7
~~0337501~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4245
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4460			P
7440-36-0	Antimony	10.4	U	N	P
7440-38-2	Arsenic	0.57	B		F
7440-39-3	Barium	39.0	B		P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2220			P
7440-47-3	Chromium	9.6			P
7440-48-4	Cobalt	7.1	B		P
7440-50-8	Copper	9.7			P
7439-89-6	Iron	13100			P
7439-92-1	Lead	2.7			F
7439-95-4	Magnesium	3080			P
7439-96-5	Manganese	214			P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	9.8			P
7440-09-7	Potassium	699	B		P
7782-49-2	Selenium	0.40	U	WN	F
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	123	B		P
7440-28-0	Thallium	0.40	U		F
7440-62-2	Vanadium	29.8			P
7440-66-6	Zinc	37.5			P
	Titanium	809			P
5955-70-0	Cyanide				NR

Color Before: BROWN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

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4/12/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBH27
~~0337501~~
BY 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4246
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.0	U		AS

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CYANIDE_ONLY.

FORM I - IN

ILM02.1
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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBH28
~~0337504~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4253
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4370			P
7440-36-0	Antimony	10.2	U	N	P
7440-38-2	Arsenic	0.48	B		F
7440-39-3	Barium	43.6			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2200			P
7440-47-3	Chromium	11.2			P
7440-48-4	Cobalt	6.7	B		P
7440-50-8	Copper	9.5			P
7439-89-6	Iron	13000			P
7439-92-1	Lead	2.6			F
7439-95-4	Magnesium	3190			P
7439-96-5	Manganese	235			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	12.3			P
7440-09-7	Potassium	678	B		P
7782-49-2	Selenium	0.41	U	N	F
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	115	B		P
7440-28-0	Thallium	0.41	U		F
7440-62-2	Vanadium	28.8			P
7440-66-6	Zinc	22.3			P
	Titanium	816			P
5955-70-0	Cyanide				NR

Color Before: BROWN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

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ILM02.1

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9/12/94

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ8
~~0337504~~
Bg 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4254
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.0	U		AS

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CYANIDE ONLY.

FORM I - IN

ILM02.1

4/12/94

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Client Sample ID:	~~4-03-219-02B~~ BS 5-20-94 BOBHZ6	Analysis Date:	03/26/94
Lab Sample ID:	AA3773	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
chloride	0.70	+	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	27	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Client Sample ID:	~~4-03-319-01E~~ BOBHZ5 Bg 5-20-94	Analysis Date:	03/27/94
Lab Sample ID:	AA3767	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.93	+	0.4
chloride	3.6	+	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	24	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	234
Client Sample ID:	~~4-03-375-01E~~ BOBH27 Sg 5-20-94	Analysis Date:	03/29/94
Lab Sample ID:	AA4247	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
chloride	0.4	U	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	2.9	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	234
Client Sample ID:	~~4-03-375-04B~~ BOBH28 Bg 5-20-94	Analysis Date:	03/29/94
Lab Sample ID:	AA4255	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
chloride	0.4	U	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	3.4	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg (ppm)	Analysis Date:	03/29/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6063	2.5	U
5-20-94 ~~4-03-219-01F~~ BOBHZ5	AA3768	12	+
5-20-94 ~~04-03-219-02F~~ BOBHZ6	AA3774	13	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	**SDG Number:**	W0004
Contract Name:	Westinghouse Hanford	**Job Number:**	234
Sample Matrix:	Soil	**Extraction Date:**	N/A
Concentration Units:	mg/kg (ppm)	**Analysis Date:**	03/29/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6063	2.5	U
bg 5-20-94 ~~4-03-375-01E~~ BOBHZ7	AA4248	2.5	U
bg 5-20-94 ~~4-03-375-04E~~ BOBHZ8	AA4256	2.5	U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	LABORATORY ID NUMBER	AGREEMENT OF INFORMATION
B09W60	Same	40320801 A-G 40320901	yes
B09W62	Same	40320802	yes

FORM NO. LS-043, Rev. 0, 2/94

9613474.1249

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INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 3/10 @ 1430 Client Name WHC

Project/Client # 94-065 Batch or Case #

Cooler ID (if noted on the outside of cooler) SML-178

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☒
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 9
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐
    Sample temperature 20°
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) na
    Request for analysis #(s) na
    Airbill # ____ Carrier ____
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature [signature] Date/Time 3/10 1450

FORM NO. LS-042, Rev.0, 2/94

9613474.1250

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WO# 204

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 3/10 1430 Client Name WHC

Project/Client # 94-045 Batch or Case # na

Cooler ID (if noted on the outside of cooler) SML-448

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☒
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 18
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 2°

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) na
    Request for analysis #(s) na
    Airbill # ____ Carrier ____
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Heidelberg Date/Time 3/10 1450

FORM NO. LS-042, Rev.0, 2/94

9613474.1251

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WO#204

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	LABORATORY ID NUMBER	AGREEMENT OF INFORMATION
BOBHZ5	Same	40321901A-F.	yes
BOBHZ6	Same	40321902A-F.	↓

FORM NO. LS-043, Rev. 0, 2/94

9613474.1252

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS / W.U. SETZEY

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 3-4-94

Ice Chest No.: SML-178 — Field Logbook No.: EFL-1115

Bill of Lading/Airbill No.: N/A — Offsite Property No.: W94-D-0369 #13

Method of Shipment: Government vehicle

Shipped to: IT, Richland

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) SAF # 94-065 NONE NOTED

Sample Identification

1) 40320801 B09W60

A 1,250ml P:CLP;TAL Metals,Hg,Ti
B 1,250ml Gs:VOA CLP
C 1,250ml aG:Semi-VOA CLP
D 1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
E 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
~~1,250ml aGs:PCB/Pest (8080)~~ HER 3-9-94
F 1,125ml G:Cyanide CLP
G 1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha (ITAS-RD-3322) Gross beta (ITAS-RD-3322), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22,I-129 (ITAS-RD-3219), Total Uranium (ITAS-RD-4200, ITAS-RD-4201) U-235,U-234,U-238 (ITAS-RD-3234) Np-237,(ITAS-RD-3208) Pu-238,Pu-239/240 (ITAS-RD-3209) Sr-90 (ITAS-RD-3204) Tc-99 (ITAS-IT-RS-0001) Am-241,Cm-244 (ITAS-RD-3302) Se-79 (ITAS-RD-3253)

40320901

032080 2 B09W62

2) 1,250mL aGs : CIP: VOA

2)
1,250ml P:CLP;TAL Metals,Hg,Ti
1,250ml Gs:VOA CLP
1,250ml aG:Semi-VOA CLP
1,125ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,250ml aGs:PCB/Pest (8080)
1,125ml G:Cyanide CLP
1,125ml Gw:Kerosene (8015M)
1,1000ml P/G:Gross alpha (ITAS-RD-3322) Gross beta (ITAS-RD-3322), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22,I-129 (ITAS-RD-3219), Total Uranium (ITAS-RD-4200, ITAS-RD-4201) U-235,U-234,U-238 (ITAS-RD-3234) Np-237,(ITAS-RD-3208) Pu-238,Pu-239/240 (ITAS-RD-3209) Sr-90 (ITAS-RD-3204) Tc-99 (ITAS-IT-RS-0001) Am-241,Cm-244 (ITAS-RD-3302) Se-79 (ITAS-RD-3253)

HER 3-9-94

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

Relinquished by:	Received by:	Date/Time:
W.U. Setzer	Heidelberg	3/10/94 @ 1450
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

9613474.1253

0000023

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST

Collector L E ROGERS — S.A.F. # 94-065 — Date

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

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09W60	S	3-4-94	0837	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) ~~1,250ml aGs:PCB/Pest (8080)~~ 3-9-94 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha (ITAS-RD-3322) Gross beta (ITAS-RD-3322), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu- 152, Eu-154, Eu-155, K-40, Ru-106, Na-22, I-129 (ITAS-RD-3219), Total Uranium (ITAS-RD-4200, ITAS-RD-4201) U-235, U-234, U-238 (ITAS-RD-3234) Np-237, (ITAS-RD-3208) Pu-238, Pu-239/240 (ITAS-RD-3209) Sr-90 (ITAS-RD-3204) Tc-99 (ITAS-IT-RS-0001) Am-241, Cm-244 (ITAS-RD-3302) Se-79 (ITAS-RD-3253)
B09W62	S	3-10-94	7000	1,250mL aGs: CLP: VOA
			3-9-94	1,250ml P:CLP;TAL Metals,Hg,Ti 1,250ml Gs:VOA CLP 1,250ml aG:Semi-VOA CLP 1,125ml G:Anions F,Cl,SO4 (EPA 300.0) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,250ml aGs:PCB/Pest (8080) 1,125ml G:Cyanide CLP 1,125ml Gw:Kerosene (8015M) 1,1000ml P/G:Gross alpha (ITAS-RD-3322) Gross beta (ITAS-RD-3322), Gamma Spec to include, Cs-134, Cs-137, Co-60, Eu- 152, Eu-154, Eu-155, K-40, Ru-106, Na-22, I-129 (ITAS-RD-3219), Total Uranium (ITAS-RD-4200, ITAS-RD-4201) U-235, U-234, U-238 (ITAS-RD-3234) Np-237, (ITAS-RD-3208) Pu-238, Pu-239/240 (ITAS-RD-3209) Sr-90 (ITAS-RD-3204) Tc-99 (ITAS-IT-RS-0001) Am-241, Cm-244 (ITAS-RD-3302) Se-79 (ITAS-RD-3253)

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

Field Information IT, Richland

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

Possible Sample Hazards NONE NOTED

A-6000-406 (06/91) WEF060

0000024

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-3.5	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		

Sample No.	Matrix*	Date Sampled	Time Sampled															
BOBHZ5	S	3-7-94	1315	X	X	X	X	X	X	X	X							
40321901AF																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1340 3-10-94	Received By: Heidelberg	Date/Time: 3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322001-Rad.

SDG W0004

LOWEST HOLDING TIME = 7DAYS

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample ; Yellow - Sampler

BC-6000-828 (12/82)

WO #204

9413176.1254

0000025

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)								
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	
No. of Container(s)				1	1	1	1	1	1	1	1					1	
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	
SAMPLE ANALYSIS				VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)	
BOBH26	S	3-8-94	1405	X	X	X	X	X	X	X	X						
40321902A-F																	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1526 3-8-94	Received By: R. J. Stull	Date/Time: 3/8/94 1526
Relinquished By: R. J. Stull	Date/Time: 3/9/94 0905	Received By: W. V. Setzer	Date/Time: 3/9/94 0906
Relinquished By: W. V. Setzer	Date/Time: 1540 3/10/94	Received By: [illegible]	Date/Time: 3/10 1430
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322002-Rad.

SDG W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

WO# 204

9518134.1255

9518134.96

WO# 254

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~049~~ 045 WJS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 403375

			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	cool 4
			Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	aG≤
			No. of Container(s)	1	1	1	1	1	1	1	1					1	1
			Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml
				VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)	VOA (Field)
				A	B	C	D	E	F								
Sample No.	Matrix*	Date Sampled	Time Sampled														
01 BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X						
02 BOBJ00	S	3-16-94	0915													X	
03 BOBHZ9	S	3-16-94	1340														X
04 BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	3-15-94 1200	R. Bayd	3/18/94 1210
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original Sample Yellow - Sampler

HC-6000-B2B (12/92)

0000026

9613474.1256

9613474.1257

0000027

WO #204

Contractor WESTINGHOUSE HANFORD COMPANY	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W94-0-0369 #13

PART I – TO BE COMPLETED BY ORIGINATOR

Department ENVIRONMENTAL	Section ENV FIELD SERVICES	Unit ENV CHARAC. & SAMPLING

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

Routing By DOE VEHICLE ☒ Contractor ☐ Vendor

Shipped to	Off-site Custodian
INTERNATIONAL TECHNOLOGIES 2800 GEORGE WASHINGTON WAY Richland, Wash 99352	TAMMY HEIDELBERG Full Title: PROJECT COORDINATOR

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1	SML 448 Poly Cooler. Soil samples double-bagged packed in wet ice and vermiculite. Samples are non-hazardous. Sample #'s: BobHZ5, BobHZ6, BobJ20	N/A

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

Necessity for the Off-Site Use of this Property

To support drilling @ 200 up-1

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

RM Clearance for Public Release	RM Survey No.	Date
[illegible]	157437	3-10-94

Location of Property (Area & Bldg.)	Contact	Phone
200 W	W.W. SETLER	(509) 376-2413

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
3-10-94	84360 17100	N/A

Originated By	Date	Authorized By	Date
[illegible]	3-10-94	W.W. Setler	3-10-94

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	3/10/94

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Heidelberg II Date 3/10/94				

DISTRIBUTION

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

9613474.1258

0000028

Contractor [illegible]	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) [illegible]

PART I – TO BE COMPLETED BY ORIGINATOR

Department [illegible]	Section [illegible]	Unit [illegible]

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

Routing ☒ Contractor ☐ Vendor

Shipped to [illegible]	Off-site Custodian [illegible]
	Full Title [illegible]

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
	[illegible]	n/a

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

Necessity for the Off-Site Use of this Property

[illegible]

BEST AVAILABLE COPY

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

RM Clearance for Public Release [illegible]	RM Survey No [illegible]	Date [illegible]
Location of Property (Area & Bldg.) [illegible]	Contact [illegible]	Phone [illegible]
Date Ready for Shipment [illegible]	Cost Code to be Charged [illegible]	Approximate Date This Property will be Returned [illegible]
Originated By [illegible]	Date [illegible] / Authorized By [illegible]	Date
Signature and Name of Property Control	Custodian Date / Property Management Approval [illegible]	Date [illegible]

PART II – TO BE COMPLETED BY SHIPPING

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

DISTRIBUTION

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

54-3000-479 (09/89)

INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001299*

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

WO RL #275

Reference Document No. 340321
Page 1 of 2

Project Name/No.[1] 94-045
Sample Team Members[2]
Profit Center No.[3] 4632
Project Manager[4] VAN Pettey
Purchase Order No.[6]
Required Report Date[11] 4-24-94

Samples Shipment Date[7] 3-11-94
Lab Destination[8] Knoxville
Lab Contact[9]
Project Contact/Phone[12]
Carrier/Waybill No.[13] Fed X 3768505194

Bill to:[5] IT Richland
Report to:[10] IT Richland

ONE CONTAINER PER LINE

Sample Number[14]	Sample Description/Type[15]	Date/Time Collected[16]	Container Type[17]	Sample Volume[18]	Pre-servative[19]	Requested Testing Program[20]	Condition on Receipt[21]	Disposal Record No.[22]
4-03-219-01A	Soil BOBHZ5	3/7 13:15	AGS	250ml	COOL 4°	VOA	2°C BYB 3/12/94	
B			AG	500ml		Semi-voa		
C			G			ICP Metals		
D			P/G	250ml		CN		
E			G			ANIONS		
F			P/G			NO2, NO3		
4-03-219-02A TH 3/11/94	Soil BOBHZ6	3/8 14:05	AGS	250ml		VOA		
B			AG	500ml		Semi-VOA		

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions:[23]

Possible Hazard Identification:[24] Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:[25] Return to Client ☒ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required:[26] Normal ☒ Rush ☐

QC Level:[27] I. ☐ II. ☒ III. ☐ Project Specific (specify): 94-045 SDG-W0004

1. Relinquished by[28] (Signature/Affiliation) Karen Ackterberg	Date: 3-11-94 Time: 16:00	1. Received by[28] (Signature/Affiliation) Bryan Blomquist ITASKN	Date: 3/12/94 Time: 9:45
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments:[29]

MCA 3/15/91

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

0000029

6213474.1299

21lbs

COC# 1244
WO# 204
RL# 275

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 340321
Page 2 of 2

Project Name 94-045

Project No.

Samples Shipment Date 3-11-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
4-03-2P9-02C	Soil BOBHZ6	3/8 14:05	G	500ml	Cool 4°	ICP Metals	2° C BB 3/12/94	
D			P/G	250ml		CN		
E			G			ANIONS		
F			P/G			NO_2, NO_3		

3/11/94

FOR LAB USE ONLY

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

MCA 3/15/91

0000030

0921 4743196

COC NO. *0001329*

Lab. Lot 324 Work Order* 234

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST A CHAIN OF CUSTODY RECORD*

Reference Document No. 340336

Page 1 of ___

Project Name/No. 1 SAF 94-045

Sample Team Members 2

Profit Center No. 3 4632

Project Manager 4 VAN PETTEY

Purchase Order No. 6

Required Report Date 11

Samples Shipment Date 7 3-18-94

Lab Destination 8 Middlebrook

Lab Contact 9

Project Contact/Phone 12

Carrier/Waybill No. 13 Fed Ex 377 0402 727

Bill to: 5 IT Richland

Report to: 10 IT Richland

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
4-03-375-01A	BOBHZ7 / soil	3/16 1300	glass	120ml	Cool 4°	VOA	5°C KHK 3-19-94	
B				500ml		Semi voa	FOR LAB USE ONLY	
C				↓		ICP + GFAA Metals Hg		
D				250ml		CN		
E				↓		300.0		
F				120ml		353.2	FOR LAB USE ONLY	
4-03-375-02A	BOBJ00 / soil	3/16 0915		120ml		VOA		
4-03-375-03A	BOBHZ9 / soil	3/16 1340		120ml		VOA		

Special Instructions: 23 As per WHC Contract

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: 25
Return to Client ☒ Disposal by Lab ☐ Archive ____ (mos.)

Turnaround Time Required: 26
Normal ☒ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify) SDG-W0004

1. Relinquished by 28 (Signature/Affiliation) Heidelberg IT — Date: 3-18-94 Time: 1600	1. Received by 28 (Signature/Affiliation) Kenya Klemm ITAS-KN — Date: 3-19-94 Time: 09:30
2. Relinquished by (Signature/Affiliation) — Date: Time:	2. Received by (Signature/Affiliation) — Date: Time:
3. Relinquished by (Signature/Affiliation) — Date: Time:	3. Received by (Signature/Affiliation) — Date: Time:

Comments: 29

WO # 234

MCA 3/15/91

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

0000030A

1921 4/13/96

WO# 234
RL# 32A

WO# 234

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 340336

Page 1 of 2

Project Name SAF 94-045

Project No. SDG-W0004

Samples Shipment Date 3-18-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
4-03-375-04A	BOBHZ8 / Soil	3/16 1300	glass	120ml	Cool 4°	VOA	5°C KAK 3-19-94	
B				500ml		Semi VOA	FOR LAB USE ONLY	
C						ICP + GFAA Metals Hg		
D				250ml		CN	FOR LAB USE ONLY	
E						300.0		
F				120ml		353.2		
4-03-375-05A	Trip blank	3/18 1000	glass	40ml	Cool 4°	VOA		
B						VOA		
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

White: To accompany samples
Yellow: Field copy

*See back of form for special instructions.

MCA 3/15/91

0000030B

9613474.1262

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Category I
JRh 10 Mar 94

WHC			31094		310	10	10	214	240

WHC/SOIL								-0.04	-0.69	-1E-01	-2E+00	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERI
B09WG0		67.9	86	1000.0	46	0	26	-0.04	1.91	-5E-01	4.8E+00	-3E-03	2.5E-02	-7E-06	1.2E-05	-3E+00	2.5E+01	Yes	-4E+03	4.1E+0

9413471.1263

0000030

WO#204

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Client Code	Received Date	Time	Screening Prep Date	Prep uGrms	Count Date	Mins Cnted	BACKGROUND Alpha	BACKGROUND Beta	BACKGROUND Mins
WHC			31094		310	10	10	214	240

Sample Number	Received Date	Sample Weight (Grams)	Weight Prep	Prep Date	Count Date	Total Alpha	Total Beta	Net Sample Count Rate Alpha	Net Sample Count Rate Beta	DCM Alpha	DCM Beta	Sample Activity Alpha	Sample Activity Beta	% Error Alpha	% Error Beta	Alpha	Beta	Screening Level Exceeded	Alpha	Beta
WHC/SOIL																				
B0BHZ5		97.1	97	1000.0	47	7	33	0.66	2.41	6.8E+00	5.4E+00	3.2E-02	2.5E-02	2.8E-05	1.2E-05	3.2E+01	2.5E+01	No	3.2E+02	4.0E+
B0BHZ6		90.4	90	1000.0	48	2	18	0.16	0.91	1.5E+00	2.1E+00	7.7E-03	1.0E-02	1.3E-05	1.1E-05	7.7E+00	1.0E+01	Yes	1.3E+03	9.5E+
TOTAL	uCi							-0.04	-0.89	-1E-01	-2E+00	3.9E-02	3.5E-02	ERR	ERR	ERR	ERR	No	ERR	E

B03H75 is category.
JRN 11 Mar 94

Category assignments are correct. JRN 11 Mar 94

$$\frac{.01}{.032} \times 1000g = \text{Cat 1 amount}$$

9413244.1264

0000030

WO#234

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Cust Code	Recieved Date	Time	Screening Prep Date	Screening Prep Time	Count Date	Mnts Cntd	BACKGROUND Alpha	BACKGROUND Beta	BACKGROUND Mnts
WHC			31894		318	10	9	170	180

All category C
JRR 18 Mar 94

Customer ID	pH <2 Rcvd/Req	Pincht Wght (mGrms)	Vol. Anal. mG ml	Sample Size Gm L	SMPLE CNT DATA Hldr Num	Total Counts Alpha	Total Counts Beta	Net Sample Counts/Minute Alpha	Net Sample Counts/Minute Beta	DPM / Aliqout Alpha	DPM / Aliqout Beta	uCi per Sample Alpha	uCi per Sample Beta	2 Sigma Error uCi per Sample Alpha	2 Sigma Error uCi per Sample Beta	pCi/(Gm or L) Alpha	pCi/(Gm or L) Beta	Catagory 1 Yes/No	Aliquot to Cat 1 Gm or Ltr Alpha	Aliquot to Cat 1 Gm or Ltr Beta
WHC/SOLIDS																				
94095-01.C16		72 6	73	250 0	35	1	16	0 05	0 66	4 1E-01	1 5E+00	6 3E-04	2 4E-03	2 0E-06	2 0E-06	2 5E+00	9 5E+00	Yes	4 0E+03	1.1E+0
94095-02.C16		80 5	81	250 0	36	0	14	0 05	0 46	5E-01	1 2E+00	-7E-04	1 6E-03	-2E-06	3 5E-06	-3E+00	6 5E+00	Yes	-4E+03	1.5E+0
WHC/SOIL																				
B0BHZ7		97 6	98	1000.0	37	0	31	0 05	2 16	7E-01	5 5E+00	-3E-03	2 5E-02	7E-06	9 2E-05	-3E+00	2 5E+01	Yes	-3E+03	4.0E+0
B0BHZ8		93 3	93	1000.0	38	1	31	0 05	2 16	3 9E-01	5 4E+00	1 9E-03	2 6E-02	7 2E-06	1 5E-04	1 9E+00	2 6E+01	Yes	5.2E+03	3.9E+0
TOTAL	uCi							0 05	0 94	2E-01	-2E+00	-1E-03	5 5E-02	ERR	ERR	ERR	ERR	Yes	ERR	ER

9413474126

0000030

9613474.1266

0000030

B09WG0 3-10-94

SAMPLE STATUS REPORT FOR E 4447. E-BLANK B09WG1 TIME: 3/ 8/94 8:32
DISPATCHED: 1/13/94 11:10 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 9

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEL

END OF REPORT

9613474.1267

0000030 G

WO#204

SAMPLE STATUS REPORT FOR E 5516. E-BLANK B0BHZ5 TIME: 3/ 9/94 8: 4
DISPATCHED: 3/ 8/94 10:31 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 14:20

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEL

END OF REPORT

9613474.1268

0000030 H

WO#204

SAMPLE STATUS REPORT FOR E 5517. E-BLANK B0BHZ6 TIME: 3/ 9/94 13:20
DISPATCHED: 3/ 8/94 10:31 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 9/94 7:39

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEL

END OF REPORT

9613474.1269

0000030 I

WO-LOT

SAMPLE STATUS REPORT FOR R 5539. HAZ. WASTE B0BJ20 TIME: 3/10/94 8:12
DISPATCHED: 3/ 8/94 10:54 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 9/94 15:18

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEL

END OF REPORT

9613474.1270

WO#234

SAMPLE STATUS REPORT FOR E 5518. E-BLANK BOBHZ7 TIME: 3/17/94 8:
DISPATCHED: 3/ 8/94 10:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/17/94 8:33

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHAR COD
****	********	**********	***	***	****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGE

END OF REPORT

SAMPLE STATUS REPORT FOR E 5519. E-BLANK BOBHZ8 TIME: 3/17/94 8:
DISPATCHED: 3/ 8/94 10:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/17/94 8:33

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHAR CODI
****	********	**********	***	***	****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEI

END OF REPORT

WVS 3-19-94

SAMPLE STATUS REPORT FOR E 5518. E-BLANK ~~BOBHZ7~~ BOBHZ9 TIME: 3/17/94 8:
DISPATCHED: 3/ 8/94 10:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/17/94 8:33

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHAR CODI
****	********	**********	***	***	****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEI

END OF REPORT

WVS 3-19-94

SAMPLE STATUS REPORT FOR E 5518. E-BLANK ~~BOBHZ7~~ BOBJ00 TIME: 3/17/94 8:
DISPATCHED: 3/ 8/94 10:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/17/94 8:33

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARC CODE
****	********	**********	***	***	*****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	VOGEI

END OF REPORT

9613474.1271

INTERNATIONAL TECHNOLOGY CORPORATION

MAY 1994
RECEIVED
SDLA

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

Dear Mr. Lerch

Thank you for purchasing analytical testing services from IT Corporation. It is our intention to supply our clients with data packages which not only meet the industry's highest standards for quality, but are also easy to use. Features which we point out are:

1. A Data Summary Packet which allows you to review your data without searching through the complete data package.

   Your Data Summary Packet contains the following items:

   - Case Narrative: listing of sample identifications, analyses performed, explanation of any problem associated with samples, corrective action taken.
   - Quality control sample identifications and analyses performed.
   - Data summary.

2. A data package which meets the specific requirements you requested and is easy to use as well. Sections are separated by color-coded tabs, making it easy to find individual analytical parameters which may be of particular interest to you. The data package is custody-sealed at the laboratory - your assurance that parts of the package are not missing.

We are constantly searching for ways to improve our service to you. This current product has many of the features which you have told us are important to you. Your suggestions regarding additional improvements will be appreciated.

Please contact me with any questions or suggestions.

Sincerely,

Suzanne Davies

Project Manager

Regional Office
2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

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INTERNATIONAL TECHNOLOGY CORPORATION

RECORD COPY

Analytical Data Package Prepared For

Westinghouse Hanford

MAY 1994
RECEIVED
SDLA

Radiochemical Analysis By

IT Analytical Services
Richland Laboratory

Sample Delivery Group Number: W0004

WHC IDENTIFICATION NUMBER	ITAS RICHLAND ID NUMBER
B0BHZ5	403220-01A
B0BHZ6	403220-02A
B0BHZ7	403376-01A
B0BHZ8	403376-02A

Regional Office
2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

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INTERNATIONAL TECHNOLOGY CORPORATION

MAY 1994 RECEIVED SDLA

CERTIFICATE OF ANALYSIS

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

May 10, 1994

Attention: J.A.Lerch

RECORD COPY

SAF Number	:	94-046
Date Received by Lab	:	March 18, 1994
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0004
Data Deliverable:	:	Stand-Alone

I. Introduction

On March 10 and 18, 1994, four soil samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the WHC specific IDs:

ITAS-Richland ID	WHC ID	Matrix	Date of Receipt
403220-01A	B0BHZ5	Soil	3/10/94
403220-02A	B0BHZ6	Soil	3/10/94
403376-01A	B0BHZ7	Soil	3/18/94
403376-02A	B0BHZ8	Soil	3/18/94

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy
Americium-241, Curium-244 by method ITAS-RD-3302
Neptunium-237 by method ITAS-RD-3208
Plutonium-238, 239/40 by method ITAS-RD-3209
Uranium-234, 235, 238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Carbon-14 by method ITAS-RD-3247
Technetium-99 by method ITAS-IT-RS-0001

III. Quality Control

The analytical results for each analysis performed under SDG W0002 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate.

Quality control sample results are reported in the same units as sample results except for gross alpha and gross beta quality control sample results which are reported in pCi/sample.

IV. Comments

The initial radioactivity screening of the samples classified them as Category I with the exception of sample B0BHZ5 which was classified as Category II.

The soil samples were received at ITAS-Richland with references to SAF 94-045 on the chain of custody (COC) documentation and sample labels. The referenced SAF number was changed to 94-046 as directed by WHC Record of Disposition No. ROD-94-0069.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The batch was reanalyzed due to failed QC samples on the first analytical processing. The second analysis of the batch was rejected due to low tracer recoveries in the samples. On the third analysis the tracer recoveries were within limits and the LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Neptunium-237 by method ITAS-RD-3208
The batch was reanalyzed due to a failed tracer yield on the matrix spike. The reanalysis data were accepted. The reanalysis batch LCS was biased high (160.9%) after yield correction using the matrix spike yield value of 65.3%. The high bias is attributed to the difference in the matrices of the matrix spike and the LCS. The LCS spike recovery was 105% without yield correction. The batch blank result was acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Plutonium-238, 239/40 by method ITAS-RD-3209
The LCS and the batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Uranium-234, 235, 238 by method ITAS-RD-3234

The LCS and the batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The samples were recounted for an extended counting time (700 min.) in order to meet the detection limit for one or more isotopes. The recount results did not meet the detection limits and the samples were counted a third time for 1000 min. The recount data were accepted. The recounts met the contractual detection limits for each requested isotope with the exception of Fe-59. The LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Gross Beta by method ITAS-RD-3222
The LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Strontium-90 by method ITAS-RD-3204
The LCS recovery was biased high (162%). The high result is attributed to strontium-85 in the spike. Concurrently analyzed spikes without strontium-85 added were acceptable. Strontium-85 will not be used in future spikes for this analysis on WHC samples. The batch blank result was acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3247
The carbon-14 results were not reportable due to insufficient carbon in the samples to perform the analysis. The carbon-14 method requires that 2 grams of carbon be present in each sample. The samples were silicate in nature with zero measurable carbon dioxide produced during sample preparation.

Technetium-99 by method ITAS-IT-RS-0001
The laboratory control sample and batch blank results were acceptable. Two matrix spike samples were analyzed and produced acceptable results. The average chemical yield was used for batch yield corrections. The sample and sample duplicate results were within the 3 sigma control limit.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

9613474.1278

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG NO.:	W0004
LAB SAMPLE ID:	4-03-220-01	MATRIX:	SOIL
WHC ID:	BOBHZ5	DATE RECEIVED:	3/10/94
REPORTING UNITS:	pCi/g		

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	5.67E-01	1.06E-01	1.38E-01	0.735	RD3302
CM-242	1.91E-02	2.20E-02	2.22E-02	0.735	RD3302
CM-244	-3.97E-04	7.94E-04	7.96E-04	0.735	RD3302
NP-237	5.86E-03	1.28E-02	1.29E-02	0.653	RD3208
PU-238	-1.71E-03	3.42E-03	3.43E-03	0.487	RD3209
PU239/40	0.00E+00	0.00E+00	2.56E-02	0.487	RD3209
U-234	9.47E-01	1.58E-01	2.05E-01	0.643	RD3234
U-235	2.12E-02	2.60E-02	2.63E-02	0.643	RD3234
U-238DA	1.03E+00	1.64E-01	2.17E-01	0.643	RD3234
CO-60	-3.23E-03	1.26E-02	1.26E-02	N/A	RD3219
FE-59	-8.41E-03	4.24E-02	4.24E-02	N/A	RD3219
EU-152	8.09E-02	5.41E-02	5.47E-02	N/A	RD3219
CO-58	1.30E-04	1.53E-02	1.53E-02	N/A	RD3219
CS-137DA	-6.08E-03	1.18E-02	1.18E-02	N/A	RD3219
EU-155	7.77E-02	3.24E-02	3.33E-02	N/A	RD3219
EU-154	-4.10E-02	4.08E-02	4.10E-02	N/A	RD3219
ALPHA	1.16E+01	3.53E+00	3.75E+00	1	RD3222
BETA	3.06E+01	2.76E+00	3.42E+00	1	RD3222
TOTAL-SR	-1.20E-02	4.32E-02	4.33E-02	0.786	RD3204
TC-99	-1.64E-01	2.50E-01	1.19E+00	0.892	ITAS-IT-RS-0001

9613474.1279

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND

SDG NO.: W0004

LAB SAMPLE ID: 4-03-220-02

MATRIX: SOIL

WHC ID: BOBHZ6

DATE RECEIVED: 3/10/94

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	5.89E-01	1.18E-01	1.54E-01	0.609	RD3302
CM-242	-6.11E-04	1.22E-03	1.23E-03	0.609	RD3302
CM-244	-9.58E-04	1.35E-03	1.36E-03	0.609	RD3302
NP-237	0.00E+00	0.00E+00	0.00E+00	0.653	RD3208
PU-238	0.00E+00	0.00E+00	2.35E-02	0.532	RD3209
PU239/40	-1.56E-03	3.13E-03	3.14E-03	0.532	RD3209
U-234	7.09E-01	1.43E-01	1.76E-01	0.586	RD3234
U-235	3.88E-02	3.48E-02	3.54E-02	0.586	RD3234
U-238DA	8.36E-01	1.55E-01	1.95E-01	0.586	RD3234
CO-60	4.51E-03	9.76E-03	9.77E-03	N/A	RD3219
FE-59	-5.22E-02	3.37E-02	3.41E-02	N/A	RD3219
EU-152	9.88E-02	4.65E-02	4.75E-02	N/A	RD3219
CO-58	5.19E-03	1.23E-02	1.23E-02	N/A	RD3219
CS-137DA	-3.04E-03	9.32E-03	9.32E-03	N/A	RD3219
EU-155	7.51E-02	2.69E-02	2.79E-02	N/A	RD3219
EU-154	1.22E-02	2.98E-02	2.98E-02	N/A	RD3219
ALPHA	6.42E+00	2.83E+00	2.91E+00	1	RD3222
BETA	1.64E+01	2.20E+00	2.45E+00	1	RD3222
TOTAL-SR	5.40E-02	5.10E-02	5.27E-02	0.838	RD3204
TC-99	-4.29E-02	2.56E-01	1.20E+00	0.892	ITAS-IT-RS-0001

682A-6-93

9613474.1280

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG NO.:**	W0004
LAB SAMPLE ID:	4-03-376-01	**MATRIX:**	SOIL
WHC ID:	BOBHZ7	**DATE RECEIVED:**	3/18/94
REPORTING UNITS:	pCi/g		

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	7.46E-01	1.30E-01	1.79E-01	0.637	RD3302
CM-242	-5.66E-04	1.13E-03	1.14E-03	0.637	RD3302
CM-244	0.00E+00	0.00E+00	1.72E-02	0.637	RD3302
NP-237	1.94E+00	2.22E-01	4.73E-01	0.653	RD3208
PU-238	-1.42E-03	2.84E-03	2.85E-03	0.586	RD3209
PU239/40	0.00E+00	0.00E+00	2.13E-02	0.586	RD3209
U-234	6.98E-01	1.33E-01	1.63E-01	0.674	RD3234
U-235	6.46E-02	4.08E-02	4.18E-02	0.674	RD3234
U-238DA	6.55E-01	1.28E-01	1.56E-01	0.674	RD3234
CO-60	9.86E-03	8.67E-03	8.73E-03	N/A	RD3219
FE-59	2.21E-02	2.83E-02	2.84E-02	N/A	RD3219
EU-152	6.59E-02	3.73E-02	3.78E-02	N/A	RD3219
CO-58	-1.27E-02	1.06E-02	1.07E-02	N/A	RD3219
CS-137DA	1.42E-02	7.32E-03	7.45E-03	N/A	RD3219
EU-155	4.05E-02	2.31E-02	2.34E-02	N/A	RD3219
EU-154	1.02E-02	2.57E-02	2.57E-02	N/A	RD3219
ALPHA	9.15E+00	3.15E+00	3.30E+00	1	RD3222
BETA	2.05E+01	2.37E+00	2.73E+00	1	RD3222
TOTAL-SR	2.11E-02	5.22E-02	5.25E-02	0.79	RD3204
TC-99	-1.79E-01	2.50E-01	1.19E+00	0.892	ITAS-IT-RS-0001

682A-6-93

9613474.1281

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG NO.:	W0004
LAB SAMPLE ID:	4-03-376-02	MATRIX:	SOIL
WHC ID:	BOBHZ8	DATE RECEIVED:	3/18/94
REPORTING UNITS:	pCi/g		

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	6.19E-01	1.09E-01	1.45E-01	0.75	RD3302
CM-242	1.20E-02	1.70E-02	1.71E-02	0.75	RD3302
CM-244	0.00E+00	0.00E+00	1.46E-02	0.75	RD3302
NP-237	6.37E-03	1.27E-02	1.28E-02	0.653	RD3208
PU-238	0.00E+00	0.00E+00	2.34E-02	0.533	RD3209
PU239/40	0.00E+00	0.00E+00	2.34E-02	0.533	RD3209
U-234	7.30E-01	1.51E-01	1.85E-01	0.541	RD3234
U-235	4.28E-02	3.77E-02	3.83E-02	0.541	RD3234
U-238DA	8.03E-01	1.58E-01	1.96E-01	0.541	RD3234
CO-60	1.45E-03	8.26E-03	8.26E-03	N/A	RD3219
FE-59	-2.01E-02	2.88E-02	2.89E-02	N/A	RD3219
EU-152	9.36E-02	3.37E-02	3.50E-02	N/A	RD3219
CO-58	-2.23E-03	1.03E-02	1.03E-02	N/A	RD3219
CS-137DA	2.40E-03	7.57E-03	7.57E-03	N/A	RD3219
EU-155	2.96E-02	2.18E-02	2.20E-02	N/A	RD3219
EU-154	-1.05E-02	2.72E-02	2.72E-02	N/A	RD3219
ALPHA	5.29E+00	2.64E+00	2.70E+00	1	RD3222
BETA	2.24E+01	2.43E+00	2.85E+00	1	RD3222
TOTAL-SR	2.87E-02	4.61E-02	4.66E-02	0.824	RD3204
TC-99	-5.48E-01	2.43E-01	1.16E+00	0.892	ITAS-IT-RS-0001

682A-6-93

9613474.1282

INTERNATIONAL TECHNOLOGY CORPORATION

0240

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland

LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): SE 5/5/94

PARAMETER(S): C 14

SAMPLE NUMBER(S) AFFECTED: 40322601-2 - 40337601-2. SPG W000

MATRIX: SOIL

AREA: [ ] SHIP/REC [X] RADIOCHEM [ ] COUNTING [ ] BIOASSAY [ ] DATA VERIF [ ] REPORTING [ ] OTHER

NONCONFORMANCE [check appropriate item(s)]:

1. [X] Not enough sample received for proper analysis.
2. [ ] Holding time exceeded by _____ days due to:
   - 2.1. [ ] CATEGORY I: Out of Laboratory Control
     - [ ] Holding time expired at receipt.
   - 2.2. [ ] CATEGORY II: Laboratory Dependent
     - [ ] work backlog [ ] instrument failure
     - [ ] communication [ ] other (see #10)
   - 2.3. [ ] CATEGORY III: Laboratory Reruns
     - 2.3.1. [ ] QA/QC:
       - [ ] surrogates [ ] internal standards
       - [ ] spike recoveries [ ] blank contamination
     - 2.3.2. [ ] CONFIRMATION:
       - [ ] second column [ ] contamination check
       - [ ] other (see #10)
     - 2.3.3. [ ] DILUTION:
       - [ ] over calibration [ ] under calibration
       - [ ] other (see #10)
     - 2.3.4. [ ] OTHER: (see #10)
3. [ ] Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. [ ] QC data reported to client outside of:
   - [ ] method limits [ ] internal limits
   - [ ] QAPP limits [ ] contract limits
   - [ ] regulatory limits [ ] blank criteria
5. [ ] Incorrect procedure(s) used. (See #10)
6. [ ] Invalid instrument calibration. (See #10)
7. [ ] Incorrect/incomplete data reported to client. (See #10)
8. [ ] Reported detection limit(s) higher than:
   - [ ] method limits [ ] QAPP limits
   - [ ] contract limits [ ] other (see #10)
   - Due to:
     - [ ] sample matrix [ ] insufficient sample
     - [ ] instrumentation [ ] other (see #10)
9. [ ] Other (specify):
10. [ ] Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. [ ] Client notified by (name and date): _____
   - [ ] in writing [ ] by FAX
   - [ ] by phone [ ] Other (explain)
2. [ ] Client's name _____ and response:
   - [ ] process "as is" [ ] resample
   - [ ] on hold til _____ [ ] Other (explain)

PROJECT MANAGER (signature & date): Suzy Haines 5/6/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0020

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IT CORPORATION LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☒ **ROOT CAUSE:** INITIALS/DATE SE 9/5/94

Insufficient Carbon in sample to perform analysis requires 2g of Carbon
Zero measureable CO_2 produced

☒ **CORRECTIVE ACTION:** INITIALS/DATE SE 5/5/94

Report inability to perform analysis

☐ **RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:**

☐ **ACTIONS TO PREVENT RECURRENCE:** INITIALS/DATE

FIRST LEVEL SUPERVISOR: Steven E Ostlund DATE: 5/5/94

RESPONSIBLE MANAGER: W Mackellar DATE: 5/5/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: Jodie Carr DATE: 5/9/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Carr DATE: 5/9/94

002

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613474.1284

0259

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): MMM 5-1-94

PARAMETER(S): Am/Cm

SAMPLE NUMBER(S) AFFECTED: 4033 7601 W0004

MATRIX: soil

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis: no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): tr yd < 20%
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Daines 5/4/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0022A

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IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE MMK 5-1-94

tr xd < 20% at 17.1%

☐ CORRECTIVE ACTION: INITIALS/DATE MMK 5-1-94

MDAmet
rerun
Rerun acceptable 5-7-94 MMK

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: M Kellogg DATE: 5-1-94

RESPONSIBLE MANAGER: W MacKillop DATE: 5/9/94

QC REVIEW

☒ NONCONFORMANCE ☒ DEFICIENCY DS 5/9/94 ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: DATE: 5/9/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: DATE: 5/9/94

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

0022B

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INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): [illegible] 5-1-94

PARAMETER(S): itn

SAMPLE NUMBER(S) AFFECTED: 2023202B, 025 W0004

MATRIX: Soil

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY ☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recovenes ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis: no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ **Other (specify):** QC out of limits
10. ☐ **Comments/Explanation:**

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): [illegible] 5/4/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0022C

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IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE MMM 5-1-94

BK is >LC. Spike recovery is out, [illegible] limits. Frozen yields are in 10% range. Possibility of contamination.

☐ CORRECTIVE ACTION: INITIALS/DATE MMM 5-1-94

The sample acids are acceptable and the days are within BT. The results are all < CL.
Rerun
rerun acceptable 5-7-94 MMM

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: M Kellogg DATE: 5-1-94

RESPONSIBLE MANAGER: W MacKellar DATE: 5/9/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: DATE: 5/9/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: DATE: 5/9/94

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

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INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): CBlack 4-12-94

PARAMETER(S): gamma

SAMPLE NUMBER(S) AFFECTED: 40337601, 40337602 WOOD4

MATRIX: soil

AREA: ☐ SHIP/REC ☑ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): MDA not met for all isotopes
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Davies 5/4/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0022E

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IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE JPK 5-2-94

initial count time insufficient to meet MDA for samples although it was sufficient to meet MDA for blank

☐ CORRECTIVE ACTION: INITIALS/DATE 4-12-94 CO

Recount 700 min. Zn 59 > MDA of .05.
Recount 2nd time for 1000 min.
MDAs < CL / JPK 5-2-94 data accepted

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: Joel Kempenne DATE: 5-2-94

RESPONSIBLE MANAGER: W. MacKellar DATE: 5/5/94

QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☒ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: Jodie Cox DATE: 5/10/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Cox DATE: 5/10/94

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

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INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): C Black 4-12-94

PARAMETER(S): gamma

SAMPLE NUMBER(S) AFFECTED: 4032201, 02, 702 W0004

MATRIX: Soil

AREA: ☐ SHIP/REC ☑ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time exoired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): MDA not met for all isotopes.
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Sergio Davies 5/4/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0022G

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IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE JK 5-2-94

low density of soils, background of natural isotopes, and time transpired from sample date to 3rd recount date relative to half life of sample

☐ CORRECTIVE ACTION: INITIALS/DATE CB 4-12-94

Recount for ~~700~~ 1000 min.
MDA met for isotopes requested except Fe 59
data accepted JK 5-2-94

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: [signature] DATE: 5-2-94

RESPONSIBLE MANAGER: [signature] DATE: 5/5/94

QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☒ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: [signature] DATE: 5/10/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: [signature] DATE: 5/10/94

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

0022H

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LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): SEE 5/2/94

PARAMETER(S): SVOT

SAMPLE NUMBER(S) AFFECTED: L0322015 W0004

MATRIX: SEE SOIL

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☒ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☒ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis: no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ **Other (specify):**
10. ☐ **Comments/Explanation:**

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date): _____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Davies 5/4/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0022 I

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IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE GEL 5/2/94

SVOS in spike (EQGI) This gives false high counts. Concurrently run spikes without SVOS e.g. L032691M were OK. Affects on spike alone. No SVOS added to samples.

☒ CORRECTIVE ACTION: INITIALS/DATE GEL 5/2/94

Report data.

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☒ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE GEL 5/2/94

SVOS will not be added in future samples.

FIRST LEVEL SUPERVISOR: [signature] DATE: GEL 5/2/94

RESPONSIBLE MANAGER: W Markell DATE: 5/5/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: Jodie Cox DATE: 5/10/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Cox DATE: 5/10/94

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

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INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-84-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WITC

NCM INITIATED BY (Name/Date): mmn 4-22-94

PARAMETER(S): Np

SAMPLE NUMBER(S) AFFECTED: 403220, 3376 40004

MATRIX: Soil

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY ☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☒ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☒ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify):
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date): _____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Daines 5/6/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

9613474.1295

IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE MMM 4-22-94

tr ydr unacceptable (no matrix spike recovery)

☐ CORRECTIVE ACTION: INITIALS/DATE MMM 4-22-94

Rerun
Reruns acceptable 5-1-94 MMM

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: M Kelley DATE: 4-22-94

RESPONSIBLE MANAGER: D MacPhee DATE: 5/6/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: D Lawrence DATE: 5/6/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: D Lawrence DATE: 5/6/94

0026

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

239

9613474.1296

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): MMM 5-2-94

PARAMETER(S): NP

SAMPLE NUMBER(S) AFFECTED: L0322025 W0004

MATRIX: Soil

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY ☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): spike recovery > 125%
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Daniels 5/6/94

0027

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

9613474.1297

IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE MMM 5-2-94

The reagent spike recovery is >160%. The reagent spike counts are corrected by the matrix spike are recovery which is the batch chemical yield. When the batch recovery is low the reagent spike may be over corrected.

☐ CORRECTIVE ACTION: INITIALS/DATE MMM 5-2-94

Without matrix spike correction the reagent spike recovery would be in the limits

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: M Kellogg DATE: 5-2-94

RESPONSIBLE MANAGER: W MacMillan DATE: 5/6/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: [signature] DATE: 5/6/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: [signature] DATE: 5/9/94

0028

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613474.1298

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2300 George Washington Way
Richland, Washington 99352

N0004 Middlebrook

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 3-18-94 1210 Client Name WHC

Project/Client # 94-045 Batch or Case # na

Cooler ID (if noted on the outside of cooler) na

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☒
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 18
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 4°C

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) na
    Request for analysis #(s) na
    Airbill # na Carrier na
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Heidelberg Date/Time 3/18 12:10

FORM NO. LS-042, Rev.0, 2/94

9613474.1299

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
3300 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 3/10 1430 Client Name WHC

Project/Client # 94-045 Batch or Case # na

Cooler ID (if noted on the outside of cooler) SML-448

1. Condition of shipping container? GR
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☒
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 18
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 2°

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) na
    Request for analysis #(s) na
    Airbill # ____ Carrier ____
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature [illegible] Date/Time 3/10 1430

FORM NO. LS-042, Rev.0, 2/94

B0BHZ5 is category II.
JRN 11 Mar 94
Category assignments are correct. JRN 11 Mar 94

0049

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Cust Code	Recieved Date	Time	Screening Prep Date	Time	Count Date	Mnts Cntd	BACKGROUND Alpha	Beta	Mnts
WHC			31094		310	10	10	214	240

Customer ID	pH <2 Rcvd/Rels	Pinchr Wght (mGrms)	Vol Anal mG	mL	Sample Size Gm	L	SMPLE CNT DATA Hldr Num.	Total Alpha	Counts Beta	Net Sample Counts/Minute Alpha	Beta	DPM / Aliquot Alpha	Beta	uCi per Sample Alpha	Beta	2 Sigma Error uCi per Sample Alpha	Beta	pCi/(Gm or L) Alpha	Beta	Catagory I Yes/No	Aliquot to Cat I Gm or Ltr Alpha	Beta
WHC/SOIL																						
B0BHZ5		97.1	97		1000.0		47	7	33	0.66	2.41	6.8E+00	5.4E+00	3.2E-02	2.5E-02	2.8E-05	1.2E-05	3.2E+01	2.5E+01	No	3.2E+02	4.0E+03
B0BHZ6		90.4	90		1000.0		48	2	18	0.16	0.91	1.5E+00	2.1E+00	7.7E-03	1.0E-02	1.3E-05	1.1E-05	7.7E+00	1.0E+01	Yes	1.3E+03	9.5E+03
TOTAL	uCi									-0.04	-0.89	-1E-01	-2E+00	3.9E-02	3.5E-02	ERR	ERR	ERR	ERR	No	ERR	ERR

0081 14 MAR 94

9613474.1301

*** C-14 ***

Due 4-24-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40322001		WHC	B0BHZ5	
2)	40322002		WHC	B0BHZ6	

ACTIONS (Initial & Date)

1) INITIATED JK 3/11/94

2) PREP LAB RECEIVED fw 3/11/94

3) SAMPLE REMAINDER STORED fw 3-15-94

4) SEPARATION LAB RECEIVED 3-15-94 DM

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1302 *** C-14 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL 94-045 BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601 F0337601		WHC	B0BHZ7	
2)	40337602		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED 3-22-94

3) SAMPLE REMAINDER STORED 3-23-94

4) SEPARATION LAB RECEIVED 3-23-94 Dm

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS C-14 MATRIX Soil DUE DATE _____

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 03220	-1B-1N-2N	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 0320	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 0337601	-		Duplicate of Sample #
3-220	- 1-2		
3-376	- 1-2		
	-		
	-	-	
	-		
	-		
	-		
	-		
	-		
	-	-	
	-		
	-		

Batched and QC updated by DM on 4-29-94 Rec'd in C.R. by [illegible] on 4/29/94

Rec'd in Prep Lab by N/A on _____ Data Reviewed and anal. Prep stored _____ on _____

Rec'd in Sep Lab by DM on 3-15-94

Rec'd in Sep lab by N/A on _____ Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9613474.1304

BATCH SUMMARY/CHAIN OF CUSTODY

4-22-94

ANALYSIS Am Cm MATRIX Soil DUE DATE 4-25-94

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 032201B ✓	-1B		QC BATCH REAGENT BLANK
L 032201S ✓	-1X		QC BATCH MATRIX BLANK
L	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 0322002 ✓	-		Duplicate of Sample # 40322002
40322001 ✓	-		
40322002 ✓	-		
40337601	-		
40337602	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

W0004

Batched and QC updated by Susie on 4-5-94 Rec'd in C.R. by KC on 4-21-94

Rec'd in Prep Lab by Susie on 4-5-94 Data Reviewed and anal. Prep stored mmm on 4-26-94

Rec'd in Sep Lab by Susie on 4-6-94

Rec'd in Sep lab by JF on 4/20/94 Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

Copy 4-21-94

9613474.1305

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 5-6

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Am

NAME/DATE mm / 5-10-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0001

MATRIX Soil

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) 40322001		
2) 02		
3) R 02		
4) 40337601		
5) 02		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ESH15983 ESJ10403

ITAS ID - BLANK L032203B 5-6-94

FOH1048 406011

ITAS ID - SPIKE L032203S 5-6-94

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED WHC

SAMPLE REMAINDER RETURNED TO SCG ☐ Bm (CHECK ONE)

NO SAMPLE REMAINING ☐

RD 3221 5/3/94 Bm

SEPARATION LAB Coppt 5-6-94 AR

COUNTING/MEASUREMENT SK 5-6-94

DATA REVIEWED mm 5-6-94

ANALYTICAL PREP STORED mm 5-6-94

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

RC-048 12/92 REV 2

0055

9613474.1306

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 5/2

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Am/Cm

NAME/DATE mmn / 4-26-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0004

MATRIX Soil

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1 H0322001 ✓	ESJ10382	
2) 02 ✓	10383	
3) F 02	10384	
4)		
5)		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ITAS ID - BLANK ESJ10381 L0322023 ✓

ITAS ID - SPIKE FQU008 025 ✓

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED 4/26/94 Bm

SAMPLE REMAINDER RETURNED TO SCG ☐ Bm (CHECK ONE)

NO SAMPLE REMAINING ☐

SEPARATION LAB RD 3221 4/27/94 Bm mmn 4-27-94 4-29-94 Sue

COUNTING/MEASUREMENT AC 4-30-94

DATA REVIEWED mmn 5-1-94

ANALYTICAL PREP STORED

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

Do Not Use SCG 5/9/94

4-30-94

RC-048 12/92 REV 2

0056

9613474.1307 *** AM/CMISO ***

Due 4-24-94 4-22-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0322201B ESJ10012				
	L0322201S IQO 002				
1)	40322001 ESJ10013		WHC	B0BHZ5	Cut II
2)	40322002 ESJ10014		WHC	B0BHZ6	
	F0322002 ESJ10015				

ACTIONS (Initial & Date)

1) INITIATED HH 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD 3221 4/1/94 Bow 4-5-94 Susan

4) SEPARATION LAB RECEIVED 4/20/94 JF

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED MMM 4-26-94

Copy 4.21.94

rerun 4-26-94 mmm

Do Not Use
SCG
5/9/94

0057

9613474.1308

4-22-94

*** AM/CMISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-19
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL 94-045

BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601	ESJ10016	WHC	B0BHZ7	
2)	40337602	ESJ10332	WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD3221 4/1/94 Bom 4-5-94 Scissa

4) SEPARATION LAB RECEIVED 4/28/94 JP

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED MMM 4-26

Do Not Use SCG 5/9/94

9613474.1309

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Np-237 MATRIX Soil DUE DATE 4-24-94

W0004

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 032201B	-1B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 032201S L033761M	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L033762M	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 0322002	-		Duplicate of Sample # 40322002
40322001	- 02		
40337601	- 02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by Bom on 3/31/94 Rec'd in C.R. by HL on 12/13/94

Rec'd in Prep Lab by Bom on 3/31/94 Data Reviewed and anal. Prep stored MMM on 4-22-94

RD 3221 4/1/94 Bom

Rec'd in Sep Lab by 4/4/94 JF on

Do Not Use - Use Recal Data

Rec'd in Sep lab by on Samples Disposed by on

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

Coppt 4·12·94 MM

Review 4-22-94 MMM

9613474.1310

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 4-24

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Np

NAME/DATE MWK / 4-20-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP

MATRIX SO-1

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) 40322001		Cat II
2) 02		
3) 40337601		
4) 02		
5) F0322002		
6) W0337601	EQR020	
7) W0337602	EQR021	
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ITAS ID - BLANK L0322023

ITAS ID - SPIKE EQR019 L0322025

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED 4/21/94 Bm

SAMPLE REMAINDER RETURNED TO SCG ☐ 4/21/94 Bm (CHECK ONE)

NO SAMPLE REMAINING ☐

SEPARATION LAB RO3221 4/21/94 Bm IF 4/22/94

COUNTING/MEASUREMENT MWM 5-1-94

DATA REVIEWED MWM 5-1-94

ANALYTICAL PREP STORED

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

RC-048 12/92 REV 2

9613474.1311

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS UP 237 MATRIX Soil DUE DATE 4/24/94

W0004

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 032202B ✓	-1B		QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L 032202S ✓	-2M or 2S (circle)	EQR019 25.094 ± .35287	QC BATCH MATRIX/REAGENT SPIKE
F 0322002 ✓	-		Duplicate of Sample # V0322002
W0337601	-	EQR020 25.109 ±	.35310
W0337602	-	EQR021 25.064 ±	.35246
40322001 VV	- 02		
40337601	- 02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by Bom on 4/21/94 Rec'd in C.R. by [illegible] on 4-30-94

Rec'd in Prep Lab by Bom on 4/21/94 Data Reviewed and anal. Prep stored MWM on 5-1-94

R03221 4/21/94 Bom

Rec'd in Sep Lab by JK on 4/22/94

Rec'd in Sep lab by _____ on _____ Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94. Rev. 4

4.30.94

9613474.1312

Due 4-24-94

*** NP-237 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0322201BV				
	L0322201SV EQR 005				
1)	40322001 ✓		WHC	BOBHZ5	CaT II
2)	40322002 ✓		WHC	BOBHZ6	

ACTIONS (Initial & Date)

1) INITIATED 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD3221 4/1/94 Bom

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED [illegible] 5-1-94

9613474.1313

*** NP-237 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL 94-045

BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601		WHC	BOBHZ7	
2)	40337602		WHC	BOBHZ8	
	L0337601M		EQR006		
	L0337602M		EQR007		

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD 3221 4/1/94 [illegible]

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED [illegible] 5-1-94

9613474.1314

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Pu ~~Lam/Lam~~ 5/4/94 MATRIX Soil DUE DATE 4-24-94

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 032201B	-1B	WHC	QC BATCH REAGENT BLANK
~~L0322015~~ 3/31/94 Bm	-1X		QC BATCH MATRIX BLANK
L032201S	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE ~~3/31/94~~ IQHI 027 IQ0 002
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 0322002	-		Duplicate of Sample # 40322002
40322001	- 02		
40337601	- 02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by Bm on 4/1/94 Rec'd in C.R. by [illegible] on 4-20-94

Rec'd in Prep Lab by Bm on 3/31/94 Data Reviewed and anal. Prep stored PK on 4-29-94

RD3221 4/1/94 Bm

Rec'd in Sep Lab by Susie 4-5-94 on 4-6-94 Susie

Rec'd in Sep lab by NA on _____ Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

EN 4.19.94 [illegible]

9613474.1315 *** PUISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF 94-045 SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601	ES14 15671	WHC	B0BHZ7	
2)	40337602	ES14 15672	WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94

RD 3221 4/1/94

4) SEPARATION LAB RECEIVED 4-5-94 Susie

5) COUNTING/MEASUREMENT LAB NA

6) DATA REVIEWED AND ANALYTICAL PREP STORED RK 4-29-94

9613474.1316

Due 4-24-94

*** PUISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0322018	ESH15667			
	L0322015	IQHI027			
1)	40322001	ESH15668	WHC	BOBHZ5	Cat II
2)	40322002	ESH15669	WHC	BOBHZ6	
	F0322002	ESH15670			

ACTIONS (Initial & Date)

1) INITIATED JH 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD 3221 4/1/94 Bm

4) SEPARATION LAB RECEIVED 4-5-94 Susie

5) COUNTING/MEASUREMENT LAB NA

6) DATA REVIEWED AND ANALYTICAL PREP STORED RK 4/29/94

4/30

9613424.1317

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Uiso MATRIX Soil DUE DATE 4-24-94

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 032201B	-1B		QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 0322015	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 03220002	-		Duplicate of Sample # 40322002
40322001	- 02		
40337601	- 02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by Bom on 3/31/94 Rec'd in C.R. by HC on 12 Apr 94

Rec'd in Prep Lab by Bom on 3/31/94 Data Reviewed and anal. Prep stored MMM on 4-19-94

RD3221 4/1/94 Bom

Rec'd in Sep Lab by Eue on 4/4/94

Rec'd in Sep lab by N/A on _____ Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

0067

Ext 4-8-94
Ext 4-9-94
ED 4-11-94

9613474.1318 *** UISO ***

Due 4-24-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0322001B ESI14899				
	L0322001S EQIC082				
1)	40322001 ESI14900		WHC	B0BHZ5	Cut II
2)	40322002 ESI14901		WHC	B0BHZ6	
	F0322002 ESI14902				

ACTIONS (Initial & Date)

1) INITIATED HH 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD3221 4/1/94 BM

4) SEPARATION LAB RECEIVED 4/4/94 Eu

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1319 *** UISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF 94-048

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601 ESI 14903		WHC	B0BHZ7	
2)	40337602 ESJ 14907		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94
RD 3221 4/1/94 Bm

4) SEPARATION LAB RECEIVED 4/4/94 Em

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED mmk 4-19-94

9613474.1320

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS GAMMA MATRIX ~~WATER~~ soil DUE DATE 4-24-94

MK 4-5-94 W0004

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 03220	-1B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 03220	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 03220	-02		Duplicate of Sample # 40322002
403220	-01-02		
403376	-01-02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by MM 3-31-94 on _____ Rec'd in C.R. by AS on 3/31/94

Rec'd in Prep Lab by MM 3-12-94 on _____ Data Reviewed and anal. Prep stored TR on 5-2-94

Rec'd in Sep Lab by N/A on _____

Rec'd in Sep lab by N/A on _____ Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9613474.1321

*** GAMMA ***

Due 4-24-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L032201B				
	L032201M				
1)	40322001		WHC	B0BHZ5	
2)	40322002		WHC	B0BHZ6	
	F0322002				

ACTIONS (Initial & Date)

1) INITIATED JH 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613474.1322

*** GAMMA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF 94-045

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601 ✓		WHC	B0BHZ7	
2)	40337602 ✓		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED AH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1323

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 4-24-94

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ~~ANALYSIS~~ RECORD

ANALYSIS Gamma

NAME/DATE CB / 4-12-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0004

MATRIX Soil

BATCH NUMBER 3-220

ITAS ID	CUSTOMER ID	COMMENTS
1) 40322001 ✓		Recount 4-12-94 1000min ~~100min~~
2) 40322002 ✓		↓
3) 70322002		↓
4)		
5)		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ITAS ID - BLANK _____

ITAS ID - SPIKE _____

CLIENT CODE _____

ACTIONS (Initial & Date)

4-12-94 CB

PREP LAB RECEIVED _____

SAMPLE REMAINDER RETURNED TO SCG _____ ☐ (CHECK ONE)

NO SAMPLE REMAINING _____ ☐

SEPARATION LAB _____

COUNTING/MEASUREMENT _____

DATA REVIEWED _____

ANALYTICAL PREP STORED _____

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT AB 4-13-94

DATA REVIEWED MK 5-2-94

ANALYTICAL PREP STORED _____

ADDITIONAL COMMENTS:

NCM issued recounts MK 5-2-94

RC-048 12/92 REV 2

9613474.1324

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 4-24-94

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ~~ANALYSIS~~ RECORD

ANALYSIS Gamma

NAME/DATE CB / 4-12-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP WX004

MATRIX Soil

BATCH NUMBER 3-376

ITAS ID	CUSTOMER ID	COMMENTS
1) 4103376 01		Recount 700 min
2) 4103376 02		↓
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ITAS ID - BLANK _____

ITAS ID - SPIKE _____

CLIENT CODE _____

4-12-94 S

ACTIONS (Initial & Date)

PREP LAB RECEIVED _____

SAMPLE REMAINDER RETURNED TO SCG _____ ☐ (CHECK ONE)

NO SAMPLE REMAINING _____ ☐

SEPARATION LAB _____

COUNTING/MEASUREMENT _____

DATA REVIEWED _____

ANALYTICAL PREP STORED _____

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT AB 4-13-94

DATA REVIEWED JRS 5-2-94

ANALYTICAL PREP STORED _____

ADDITIONAL COMMENTS:

RC-048 12/92 REV 2

9613474.1325

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 4-21

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Gamma

NAME/DATE CB / 4-15

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0004

MATRIX Soil

BATCH NUMBER 3-376

ITAS ID	CUSTOMER ID	COMMENTS
1) 40337601		Recount 1000min
2) 02		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ITAS ID - BLANK _____

ITAS ID - SPIKE _____

CLIENT CODE _____

4-15-94 CB

ACTIONS (Initial & Date)

PREP LAB RECEIVED _____

SAMPLE REMAINDER RETURNED TO SCG _____ ☐ (CHECK ONE)

NO SAMPLE REMAINING _____ ☐

SEPARATION LAB _____

COUNTING/MEASUREMENT _____

DATA REVIEWED _____

ANALYTICAL PREP STORED _____

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT GK 4-16-94

DATA REVIEWED JRK 5-2-94

ANALYTICAL PREP STORED _____

ADDITIONAL COMMENTS:

OK to Transfer
JRK 5-2-94

NCM issued re count
JRK 5-2-94

RC-048 12/92 REV 2

9613474.1326

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS ALPHA MATRIX SOIL DUE DATE 4-24-94

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 03220	-1B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 03220	-1M or 1S (circle)	EGEG 190	QC BATCH MATRIX/REAGENT SPIKE 4.5036 ± .0432
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 03220	- 02		Duplicate of Sample # 40322002
403220	- 01-02		
403376	- 01-02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by MM on 3-31-94 Rec'd in C.R. by AS on 3/31/94

Rec'd in Prep Lab by MM on 3-12-94 Data Reviewed and anal. Prep stored JR on 4-4-94

Rec'd in Sep Lab by N/A on

Rec'd in Sep lab by N/A on Samples Disposed by on

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9613474.1327

*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL 94-045

BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601		WHC	B0BHZ7	
2)	40337602		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1328

Due 4-24-94

*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0322018 / L0322015 /				
1)	40322001 /		WHC	B0BHZ5	
2)	40322002 / F0322002 /		WHC	B0BHZ6	

ACTIONS (Initial & Date)

1) INITIATED JH 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613474.1329

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS BETA MATRIX SOIL DUE DATE 4-24-94

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 03220	-1B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 03220	-1M or 1S (circle)	EQBA 436	QC BATCH MATRIX/REAGENT SPIKE 11.283 1.1592
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 03220	-02		Duplicate of Sample # 40322002
403220	-01-02		
403376	-01-02		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by MM on 3-31-94 Rec'd in C.R. by AJ on 3-31-94

Rec'd in Prep Lab by MM on 3-12-94 Data Reviewed and anal. Prep stored JTR on 4-4-94

Rec'd in Sep Lab by N/A on

Rec'd in Sep lab by N/A on Samples Disposed by on

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9613474.1330

Due 4-24-94

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L032201B L032201S				
1)	40322001		WHC	BOBHZ5	
2)	40322002 F032200 2		WHC	BOBHZ6	

ACTIONS (Initial & Date)

1) INITIATED 3/11/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613474.1331

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL 94-045

BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601		WHC	B0BHZ7	
2)	40337602		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED MM 3-22-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1352

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS TOTAL SR MATRIX SOIL DUE DATE 4-24-94

W0004

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L03220	-1B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L03220	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE EGGI 092 5.27495 ± .0757 PCi/G 70.262 ± 1.008 DPM
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F0322002	-		Duplicate of Sample # 40322002
40322001	2		2 SR
40337601	2		2 SR
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by [illegible] on 4/7/94 Rec'd in C.R. by AP on 4-27-94

Rec'd in Prep Lab by [illegible] on 4/7/94 Data Reviewed and anal. Prep stored [illegible] on 5/2/94.

Rec'd in Sep Lab by [illegible] on 4-11-94

Rec'd in Sep lab by ↓ on ↓ Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9613474.1333 TOTAL - SR
*** ~~GR-90~~ *** 3-21-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF 94-045 SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL BATCH NUMBER 3376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601		WHC	B0BHZ7	
2)	40337602		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED 3/21/94

2) PREP LAB RECEIVED _____

3) SAMPLE REMAINDER STORED _____

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1334 Total Sr

Due 4-24-94

*** SR-90 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L032201 B L032201 S				
1)	40322001		WHC	B0BHZ5	
2)	40322002 F0322002-Dup		WHC	B0BHZ6	

ACTIONS (Initial & Date)

1) INITIATED AH 3/11/94

2) PREP LAB RECEIVED _____

3) SAMPLE REMAINDER STORED _____

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613474.1335

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Tc. 99 MATRIX Water DUE DATE 4/24/94

W0004

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 03220	-1B	WHC	QC BATCH REAGENT BLANK
L ~~W~~03220	-1X		QC BATCH MATRIX BLANK
L W 033760 1 4/1/94 L032201 M	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE
L W 033760 2 4/1/94	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 0322002	-		Duplicate of Sample # 40322002
40322001	- 02		
40337601	- 02		
	-		
	-		
	-		
	-		
L032201 N	- instrument		
L032202 N	- Blanks		
	-		
L032201M	- EQN# 130		22.5518 ± .2789 PCI 100.13 ± 1.2384 DPM
W0337601	- EQN# 122		22.4903 ± .2782 PCI 99.857 ± 1.2351
W0337602	- EQN# 129		22.545 ± .2788 PCI 100.1 ± 1.238

Batched and QC updated by MM on 4/25/94 Rec'd in C.R. by [illegible] on 4/25/94

Rec'd in Prep Lab by MM on 3-12-94 Data Reviewed and anal. Prep stored [illegible] on 5/1/94

Rec'd in Sep Lab by MM on 4/01/94

Rec'd in Sep lab by NA on NA Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9613474.1336

Due 4-24-94

*** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

11-Mar-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL

BATCH NUMBER 3-220

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L032201B		W083762 M	W032201X	
	W083761M		L032201 M		
1)	40322001		WHC	B0BHZ5	CAT II
2)	40322002		WHC	B0BHZ6	
	F0322002				

ACTIONS (Initial & Date)

1) INITIATED JH 3/1/94

2) PREP LAB RECEIVED MM 3-12-94

3) SAMPLE REMAINDER STORED MM 3-30-94

4) SEPARATION LAB RECEIVED 4/01/94 mm

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613474.1337

*** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

21-Mar-1994
Page 1

CUSTOMER: WHC SAF 94-045 SAMPLE DELIVERY GROUP W0004

MATRIX : SOIL BATCH NUMBER 3-376

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40337601		WHC	B0BHZ7	
2)	40337602		WHC	B0BHZ8	

ACTIONS (Initial & Date)

1) INITIATED JH 3/21/94

2) PREP LAB RECEIVED LMM 3-22-94

3) SAMPLE REMAINDER STORED LMM 3-30-94

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

11/11/94

Data Validation Check List

for Project 200-UP-1

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0BHZ5		W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/10/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ6		W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/10/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ7		W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/18/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ8	field dup of B0BHZ7	W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/18/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ9	FIELD BLANK	W0004	022	ITC	Y 5/24/94	N	N	N	N	03/18/94 - SAF-94-046	N	5/24/94
B0BJ00	TRIP BLANK	W0004	022	ITC	Y 5/24/94	N	N	N	N	03/18/94 - SAF-94-046	N	5/24/94

Data Entry Complete: DP DEa 11-11-94

DATATRAC [illegible]
11/11/94

Validation Rcvd 11-11-94

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Golder Associates Inc.

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

Golder Associates

Nov
DFa 11-11-94
OCT 1994
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November 10, 1994

Our ref: 943-1610.031.0400
943-1610.035.0400
94-1610/0/55

CH2M Hill
P.O. Box 1510
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGES, 200-UP-1 DATA VALIDATION PACKAGES, ENVIRONMENTAL AND WASTE CHARACTERIZATION ANALYTICAL DATA VALIDATION CONTRACT MSH-SWV-315905

Dear Ms. Duncan:

Enclosed are data validation reports for the 200-UP-1 validation project. The data package(s) in this shipment are as follows:

- W0063-ITC-071
- W0004-ITC-022

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

Kent M. Angelos
Project Manager

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DON'T SAY IT - - WRITE IT!

Date: 12/20/94 PKR

From: P. K. Reich H4-14, (509) 372-2785

Subject: Correction of Validation Date Received Stamp

The date stamped on this validation report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front pages(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Sample Management

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MEMORANDUM

NOV 1994 ~~OCT~~ 1994 RECEIVED Validation Log In

Original Validation Report date received 12/20/94 PKR

TO: 200-UP-1 Round 1 Soil, Project QA Record November 8, 1994

FR: Diana Waterbury, Golder Associates Inc. DSW

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0004-ITC-022, (943-1610.031, 022VOA.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by the International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	VOLATILES	
B0BHZ6*	SOIL	VOLATILES	
B0BHZ7	SOIL	VOLATILES	
B0BHZ8	SOIL	VOLATILES	DUPLICATE OF B0BHZ7
B0BHZ9	SOIL	VOLATILES	FIELD BLANK
B0BJ00	SOIL	VOLATILES	TRIP BLANK
TRIP BLANK	SOIL	VOLATILES	
* Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of seven (7) samples were validated in this data package with a total of 231 determinations reported,

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MEMORANDUM

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original Val Rpt date received 12/20/94 VRK

TO: 200-UP-1 Round 1 Soil, Project QA Record November 8, 1994

FR: Diana Waterbury, Golder Associates Inc. DSW

RE: SEMIVOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0004-ITC-022, (943-1610.031, 022SVOA.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by the International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	SEMIVOLATILES	
B0BHZ6*	SOIL	SEMIVOLATILES	
B0BHZ7	SOIL	SEMIVOLATILES	
B0BHZ8	SOIL	SEMIVOLATILES	DUPLICATE OF B0BHZ7
		SEE ATTACHMENT 4	

* Indicates sample results which were 100% recalculated.

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of four (4) samples were validated in this data package with a total of 256 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

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original Validation Report Received 10/20/94 PKR

TO: 200-UP-1 Project QA Record

November 8, 1994

FR: Diana Waterbury, Golder Associates Inc. DSW

RE: INORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE W0004-ITC-022 (943-1610.031 022MET.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	METALS	
B0BHZ6*	SOIL	METALS	
B0BHZ7	SOIL	METALS	
B0BHZ8	SOIL	METALS	DUPLICATE OF B0BHZ7
		SEE ATTACHMENT 4	
* Indicates the sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as incicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of matrix spike spike recoveries as described below.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 100 determinations

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MEMORANDUM

NOV 1994

TO: 200-UP-1 Round 1 Soil Project QA Record November 28, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0004-ITC-022 (943-1610.031 022RAD.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by International Technology Laboratory. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	MEDIA	ANALYSIS
B0BHZ5		SOIL	RADIOCHEMISTRY
B0BHZ6*		SOIL	
B0BHZ7		SOIL	SEE ATTACHMENT 4
B0BHZ8	DUPLICATE OF B0BHZ7	SOIL	
* Indicates the sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the minor deficiencies identified below.

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

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

Revised 11-28-94

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MEMORANDUM

NOV 1994 RECEIVED Validation Log In

TO: 200-UP-1 Round 1 Soil, Project QA Record November 28, 1994

FR: Diana Waterbury, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR
DATA PACKAGE: W0004-ITC-022, (943-1610.031, 022VOA.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by the International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	VOLATILES	
B0BHZ6*	SOIL	VOLATILES	
B0BHZ7	SOIL	VOLATILES	
B0BHZ8	SOIL	VOLATILES	DUPLICATE OF B0BHZ7
B0BHZ9	SOIL	VOLATILES	FIELD BLANK
B0BJ00	SOIL	VOLATILES	TRIP BLANK
TRIP BLANK	SOIL	VOLATILES	
* Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of seven (7) samples were validated in this data package with a total of 231 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

001

DBW revised page

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Continuing Calibration Verification

- The continuing calibration %D for bromoform, associated with sample W004TB, bromomethane and 1,1 dichloroethene, associated with samples B0BHZ5 and B0BHZ6, were unacceptable. Attachments 2 and 5 provide supporting documentation.

Laboratory Blanks

- Methylene chloride and Acetone were detected in the laboratory blank. Attachments 2 and 5 provide supporting documentation.

FIELD QC

- Sample B0BJ00 was identified as a trip blank and sample B0BHZ9 was identified as a field blank. There were no target analytes detected in the samples.

- Sample B0BHZ8 was identified as the field duplicate of sample B0BHZ7. All relative percent differences (%RPD) were within control limits. Qualification is not required based on field QC.

TENTATIVELY IDENTIFIED COMPOUNDS

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

- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and determined to be presumptive and valid (UJN).

- TICs were detected in the samples and determined to be valid, resulting in qualification of the associated results as presumptive and valid (JN).

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

11-28-94
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WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

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Revised 11-28-94
page 002A

9613474.1348

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1. GLOSSARY OF DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

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

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

ATTACHMENT 2 - SUMMARY OF DATA QUALIFICATIONS

SDG: W0004-ITC-022	BY: D. Waterbury	DATE: 11/28/94	PAGE 1 OF 1
COMMENTS: VOLATILE ORGANICS			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
Bromomethane	UJ	B0BHZ5	Associated continuing calibration.
1,1 Dichloroethene	UJ	B0BHZ5	Associated continuing calibration.
Bromomethane	UJ	B0BHZ6	Associated continuing calibration.
1,1 Dichloroethene	UJ	B0BHZ6	Associated continuing calibration.
Bromoform	UJ	W004TB	Associated continuing calibration.
Acetone	U	ALL	Blank contamination.
Methylene Chloride	U	B0BHZ5 B0BHZ6 B0BHZ7 B0BHZ8 B0BHZ9 B0BJ00	Blank contamination.

NSW revised page 11-28-94

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	BOBHZ5		BOBHZ6		BOBHZ7		BOBHZ8		BOBHZ9		BOBJ00	
	Date	3-7-94		3-8-94		3-16-94		3-16-94		3-16-94		3-16-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE		FIELD BLANK		TRIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMOMETHANE	UG/KG	12.000	UJ	11.000	UJ	10.000	U	10.000	U	10.000	U	10.000	U
VINYL CHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
ACETONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CARBON DISULFIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	12.000	UJ	11.000	UJ	10.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROFORM	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
2-BUTANONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TRICHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BENZENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMOFORM	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
2-HEXANONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TOLUENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROBENZENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
ETHYLBENZENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
STYRENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U

The decimal places shown do not reflect the precision reported by the laboratory

RSH
11-7-94

9413174.1555

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	W004TB	
	Date	3-16-94	
	Location	299-W19-35	
	Depth	---	
	Type	SOIL	
	Comments	TRIP BLANK	
Parameter	Units	Result	Q
CHLOROMETHANE	UG/KG	10.000	U
BROMOMETHANE	UG/KG	10.000	U
VINYL CHLORIDE	UG/KG	10.000	U
CHLOROETHANE	UG/KG	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U
ACETONE	UG/KG	14.000	U
CARBON DISULFIDE	UG/KG	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U
CHLOROFORM	UG/KG	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U
2-BUTANONE	UG/KG	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U
BENZENE	UG/KG	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U
BROMOFORM	UG/KG	10.000	UJ
4-METHYL-2-PENTANONE	UG/KG	10.000	U
2-HEXANONE	UG/KG	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U
TOLUENE	UG/KG	10.000	U
CHLOROBENZENE	UG/KG	10.000	U
ETHYLBENZENE	UG/KG	10.000	U
STYRENE	UG/KG	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U

The decimal places shown do not reflect the precision reported by the laboratory

KSW
11-7-94

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ5 89
~~40321901~~ 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3763

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN12

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	~~U~~ UJ
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	~~12~~ 3	~~BJ~~ U
67-64-1	Acetone	~~12~~ 5	~~BJ~~ U
75-15-0	Carbon Disulfide	12	U
75-35-4	1,1-Dichloroethene	12	~~U~~ UJ
75-34-3	1,1-Dichloroethane	12	U
540-59-0	1,2-Dichloroethene (total)	12	U
67-66-3	Chloroform	12	U
107-06-2	1,2-Dichloroethane	12	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	12	U
56-23-5	Carbon Tetrachloride	12	U
75-27-4	Bromodichloromethane	12	U
78-87-5	1,2-Dichloropropane	12	U
10061-01-5	cis-1,3-Dichloropropene	12	U
79-01-6	Trichloroethene	12	U
124-48-1	Dibromochloromethane	12	U
79-00-5	1,1,2-Trichloroethane	12	U
71-43-2	Benzene	12	U
10061-02-6	trans-1,3-Dichloropropene	12	U
75-25-2	Bromoform	12	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	12	U
79-34-5	1,1,2,2-Tetrachloroethane	12	U
108-88-3	Toluene	12	U
108-90-7	Chlorobenzene	12	U
100-41-4	Ethylbenzene	12	U
100-42-5	Styrene	12	U
1330-20-7	Xylenes (total)	12	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BOBHZ5
~~40321901~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3763

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN12

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 14 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN ALKANE	18.95	10	~~J~~	JN
2.	UNKNOWN ALKANE	21.48	16	~~J~~	JN
3.	OCTANE, TRIMETHYL-	21.68	14	~~JY~~	JN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B08HZ6
~~40321902~~
Bg 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3769

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN15

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 9 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	~~U~~ 4.5
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11 ~~3~~	~~BJ~~ 4
67-64-1	Acetone	11 ~~7~~	~~BJ~~ 4
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	~~U~~ 4.5
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylenes (total)	11	U

RSB 11-28-94 Reviewed page 012

9613474.1358

~~0000088~~ 10SW

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBH26
~~40321902~~
DS 6/6/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3769

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ACN15

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: not dec. 9 Date Analyzed: 03/14/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613474.1359

~~0000018~~ CS

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BCBHZ7
~~10337501~~
Bg 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4243

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4243

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10.2	~~J~~ U
67-64-1	Acetone	10.5	~~J~~ 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	Xylenes (total)	10	U

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014

RSW revised page 11-28-94

9613474.1360

VOA-TIC ~~C0000001~~ 0000072.94 JSM 6-22

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ7

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4243

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4243

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	18	~~JB~~ USN

9613474.1361

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ8
~~40337504~~
5-20-94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4251

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4251

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10 ~~2~~	J — 4
67-64-1	Acetone	10 ~~5~~	J — 4
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	Xylenes (total)	10	U

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KSW revised page 11-28-94 016

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BOBHZ8

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4251

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4251

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	17	~~JB~~ USN

9613474.1363

~~0000020~~ DSW

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ9
~~40337503~~
Bg 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4250

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4250

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10 ~~8~~	J — U
67-64-1	Acetone	10 ~~7~~	J — 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	Xylenes (total)	10	U

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revised page 11-28-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ9

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4250

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4250

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	20	~~JB~~ UJN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOB300
~~40337502~~
B 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4249

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4249

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10 ~~2~~	~~J~~ 4
67-64-1	Acetone	10 ~~4~~	~~J~~ 4
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	Xylenes (total)	10	U

KSH revised 020 7-8-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BOBJOO

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4249

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4249

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	13	~~JB~~ UW

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Triplblank
~~40337505~~
GS/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) WATER Lab Sample ID: AA4257

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AA4257

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. ____ Date Analyzed: 03/23/94

GC Column: DB-624 ID: 0.530 (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	~~10.2~~	~~BJ~~ U
67-64-1	Acetone	14	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~~ UJ
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	Xylenes (total)	10	U

FORM I VOA

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIPBLANK

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) WATER Lab Sample ID: AA4257

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AA4257

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. 3 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.23	10	~~J~~ UJ

9613474.1369

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 22 , 1994

Job Number: 204 & 234

This is the Certificate of Analysis for the following samples:

SDG:	W0004
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	03/12/94 & 03/19/94
Number of Samples:	Seven (7)
Sample Type:	Soil - six (6), Water - one (1)

I. Introduction

On March 12 and March 19, 1994, six (6) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

III. Quality Control

The volatile analyses were performed March 14-15, March 23 and March 26, 1994 by purge and trap with a J & W DB-624 column on Hewlett-Packard 5970 and Finnigan INCOS 500 GC/MS/DS units. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

The semivolatile analyses were performed March 29-30 and April 5-6, 1994 by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS unit. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

The samples were digested on April 1, 1994 for ICP and March 31, 1994 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on April 1, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from March 31 through April 2, 1994; the remaining metals were analyzed by ICP on April 2, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBHZ5. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for antimony by ICP analysis and selenium by GFAA analysis. A post digestion spike was performed for antimony as required by CLP protocol. As the lead and titanium concentrations were greater than four times (4X) the spike added, spiking criteria did not apply for these analytes. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses. MSAs were performed as required by CLP protocol.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

On March 29, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C). Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

The samples were analyzed for anions from March 26 through April 2, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Matrix	Test
AA3763	4-03-219-01A	BOBHZ5	SOIL	VOC
AA3764	4-03-219-01B	BOBHZ5	SOIL	SVOC
AA3765	4-03-219-01C	BOBHZ5	SOIL	METALS
AA3766	4-03-219-01D	BOBHZ5	SOIL	CN
AA3767	4-03-219-01E	BOBHZ5	SOIL	ANIONS
AA3768	4-03-219-01F	BOBHZ5	SOIL	NO3NO2
AA3769	4-03-219-02A	BOBHZ6	SOIL	VOC
AA3770	4-03-219-02B	BOBHZ6	SOIL	SVOC
AA3771	4-03-219-02C	BOBHZ6	SOIL	METALS
AA3772	4-03-219-02D	BOBHZ6	SOIL	CN
AA3773	4-03-219-02E	BOBHZ6	SOIL	ANIONS
AA3774	4-03-219-02F	BOBHZ6	SOIL	NO3NO2
AA4243	4-03-375-01A	BOBHZ7	SOIL	VOC
AA4244	4-03-375-01B	BOBHZ7	SOIL	SVOC
AA4245	4-03-375-01C	BOBHZ7	SOIL	METALS
AA4246	4-03-375-01D	BOBHZ7	SOIL	CN
AA4247	4-03-375-01E	BOBHZ7	SOIL	ANIONS
AA4248	4-03-375-01F	BOBHZ7	SOIL	NO3NO2
AA4249	4-03-375-02A	BOBJOO	SOIL	VOC
AA4250	4-03-375-03A	BOBHZ9	SOIL	VOC
AA4251	4-03-375-04A	BOBHZ8	SOIL	VOC
AA4252	4-03-375-04B	BOBHZ8	SOIL	SVOC
AA4253	4-03-375-04C	BOBHZ8	SOIL	METALS
AA4254	4-03-375-04D	BOBHZ8	SOIL	CN
AA4255	4-03-375-04E	BOBHZ8	SOIL	ANIONS
AA4256	4-03-375-04F	BOBHZ8	SOIL	NO3NO2
AA4257	4-03-375-05A	Trip Blank	WATER	VOC
AA4257	4-03-375-05B	Trip Blank	WATER	VOC

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-3.5	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)				1	1	1	1	1	1	1	1					1		
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
B0BHZ5	S	3-7-94	1315	X	X	X	X	X	X	X	X							
40321901AF																		

SAMPLE ANALYSIS

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1340 3-10-94	Received By: Heidelberg	Date/Time: 3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

H0322001-Rad.

SDG W0004

LOWEST HOLDING TIME = 7DAYS

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample ; Yellow - Sampler

BC-6000-928 (12/92)

WO #204

9613474.1376

031

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)				1	1	1	1	1	1	1	1					1		
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
BOBHZ6	S	3-8-94	1405	X	X	X	X	X	X	X	X							
40321902A-F																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1526 3-8-94	Received By: R. J. Stull	Date/Time: 3/8/94 1526
Relinquished By: R. J. Stull	Date/Time: 3/9/94 0905	Received By: W. V. Setzer	Date/Time: 3/9/94 0906
Relinquished By: W. V. Setzer	Date/Time: 1540 3/10/94	Received By: [illegible]	Date/Time: 3/10 1430
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322002-Rad.

SDG-W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-928 (12/92)

9613474.1377

WO# 204

0000025

032

WO#234

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045 045 WJS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	cool 4	
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	aG≤	
No. of Container(s)	1	1	1	1	1	1	1	1					1	1	
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml	
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)	VOA (Field)	
403375	A	B	C	D	E	F									

	Sample No.	Matrix*	Date Sampled	Time Sampled													
1	BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X					
2	BOBJ00	S	3-16-94	0915											X		
3	BOBHZ9	S	3-16-94	1340												X	
4	BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	3-18-94 1200	R. Bayd	3/18/94 1210

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original Sample Yellow - Sampler

HC-6000-828 (12/92)

9616744.1579

033

WO# 234
RL# 32A

WO# 234

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 340336
Page 1 of 2

Project Name SAF 94-045

Project No. SDG-W0004

Samples Shipment Date 3-18-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
4-03-375-04A	BOBHZ8 / Soil	3/16 1300	glass	120ml	Cool 4°	VOA	5°C KHE 3-19-94	
B				500ml		Semi VOA	FOR LAB USE ONLY	
C						ICP + GFAA Metals Hg		
D				250ml		CN	FOR LAB USE ONLY	
E						300.0		
F				120 ml		353.2		
4-03-375-05A	Trip blank	3/18 1000	glass	40ml	Cool 4°	VOA		
B						VOA		
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

White: To accompany samples Yellow Field copy

*See back of form for special instructions.

MCA 3/15/91

96134.1379

034

9613474.1300

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		DATA PACKAGE: W0004.ITC.022	
VALIDATOR: WATERBURY	LAB: IT		DATE: 10.31.94
CASE:		SDG: W0004	

ANALYSES PERFORMED

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

SAMPLES/MATRIX
BOBHZ5 - SOIL
* BOBHZ6 - SOIL
BOBHZ7 - SOIL
BOBHZ8 - SOIL
BOBHZ9 -
BOBJ00 -

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: SEE ATTACHMENT B-1.

036

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

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

Are continuing calibrations acceptable? . . . . . Yes No[1] N/A

Comments: (1) The %D for Bromoform in the CC was unacceptable. Trip blank sample is qualified UJ for Bromoform, with associated sample. The %D for Bromomethane & 1,1 Dichloroethene ~~are~~ in the CC were unacceptable. Samples B0BH25 & B0BH26 are qualified.

4. BLANKS

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

Are laboratory blank results acceptable? . . . . . Yes No[1] N/A

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

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

Comments: B0BH29 - Field blank soil
B0BJ00 - Trip blank soil

(1) Methylene Chloride and Acetone were detected in the laboratory blank. Associated detects in the samples were qualified (U) and values raised to the CRDL.

ASH 11-28-94

5. ACCURACY

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

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

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

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

Comments:

ASH revised page 037 11-28-94

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments: No field split results given in data.

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

Comments:

038

HOLDING TIME SUMMARY

SDG: WD004-ITC-02 VALIDATOR: WATERBURY DATE: 10/28/94 PAGE 1 OF ____

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBHZ5	VOA	3.7.94		3.14.94		7	none.
BOBHZ6	VOA	3.8.94		3.14.94		6	none.
BOBHZ7	VOA	3.16.94		3.26.94		10	none.
BOBHZ8	VOA	3.16.94		3.26.94		10	none.
BOBJ00	VOA	3.16.94		3.26.94		10	none.
BOBHZ9	VOA	3.16.94		3.26.94		10	none
TRIP BLANK	VOA	3.18.94		3.23.94		5	none.

9613474.1384

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Instrument ID: 5970A Calibration date: 03/14/94 Time: 1517

Lab File ID: ACN03 Init. Calib. Date(s): 01/26/94 01/26/94

Heated Purge: (Y/N) Y Init. Calib. Times: 0949 1211

GC Column: DB-624 ID: 0.250(mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	1.462	1.699		-16.2	
Bromomethane	0.970	1.235	0.100	-27.3	25.0
Vinyl Chloride	1.462	1.760	0.100	-20.4	25.0
Chloroethane	0.509	0.578		-13.6	
Methylene Chloride	1.692	2.024		-19.6	
Acetone	0.917	0.583		36.4	
Carbon Disulfide	4.477	5.675		-26.8	
1,1-Dichloroethene	1.154	1.448	0.100	-25.5	25.0
1,1-Dichloroethane	2.814	3.082	0.200	-9.5	25.0
1,2-Dichloroethene (total)	1.474	1.872		-27.0	
Chloroform	2.962	3.322	0.200	-12.2	25.0
1,2-Dichloroethane	2.540	2.663	0.100	-4.8	25.0
2-Butanone	1.423	1.006		29.3	
1,1,1-Trichloroethane	0.551	0.551	0.100	0.0	25.0
Carbon Tetrachloride	0.497	0.501	0.100	-0.8	25.0
Bromodichloromethane	0.516	0.512	0.200	0.8	25.0
1,2-Dichloropropane	0.360	0.387		-7.5	
cis-1,3-Dichloropropene	0.602	0.622	0.200	-3.3	25.0
Trichloroethene	0.401	0.430	0.300	-7.2	25.0
Dibromochloromethane	0.484	0.462	0.100	4.5	25.0
1,1,2-Trichloroethane	0.364	0.368	0.100	-1.1	25.0
Benzene	1.192	1.308	0.500	-9.7	25.0
trans-1,3-Dichloropropene	0.590	0.586	0.100	0.7	25.0
Bromoform	0.358	0.289	0.100	19.3	25.0
4-Methyl-2-Pentanone	0.670	0.482		28.1	
2-Hexanone	0.548	0.355		35.2	
Tetrachloroethene	0.334	0.329	0.200	1.5	25.0
1,1,2,2-Tetrachloroethane	0.714	0.568	0.500	20.4	25.0
Toluene	1.425	1.492	0.400	-4.7	25.0
Chlorobenzene	1.029	1.062	0.500	-3.2	25.0
Ethylbenzene	0.498	0.522	0.100	-4.8	25.0
Styrene	1.019	1.050	0.300	-3.0	25.0
Xylenes (total)	0.584	0.613	0.300	-5.0	25.0
Toluene-d8	1.215	1.301		-7.1	
4-Bromofluorobenzene	0.529	0.528	0.200	0.2	25.0
1,2-Dichloroethane-d4	1.906	2.137		-12.1	

All other compounds must meet a minimum RRF of 0.010.

FORM VII VOA 3/90

11-7-94

H25
H26

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Instrument ID: I500A Calibration date: 03/23/94 Time: 1120

Lab File ID: WS0323 Init. Calib. Date(s): 03/21/94 03/21/94

Heated Purge: (Y/N) N Init. Calib. Times: 1129 1403

GC Column: DB-624 ID: 0.530(mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	1.011	1.142		-13.0	
Bromomethane	1.392	1.516	0.100	-8.9	25.0
Vinyl Chloride	1.078	1.221	0.100	-13.3	25.0
Chloroethane	1.722	1.098		36.2	
Methylene Chloride	1.304	1.327		-1.8	
Acetone	0.336	0.357		-6.2	
Carbon Disulfide	3.211	3.205		0.2	
1,1-Dichloroethene	1.081	1.177	0.100	-8.9	25.0
1,1-Dichloroethane	2.310	2.722	0.200	-17.8	25.0
1,2-Dichloroethene (total)	1.207	1.282		-6.2	
Chloroform	2.587	2.947	0.200	-13.9	25.0
1,2-Dichloroethane	1.564	1.734	0.100	-10.9	25.0
2-Butanone	0.567	0.649		-14.5	
1,1,1-Trichloroethane	0.598	0.580	0.100	3.0	25.0
Carbon Tetrachloride	0.540	0.494	0.100	8.5	25.0
Bromodichloromethane	0.636	0.518	0.200	18.6	25.0
1,2-Dichloropropane	0.401	0.406		-1.2	
cis-1,3-Dichloropropene	0.529	0.486	0.200	8.1	25.0
Trichloroethene	0.409	0.403	0.300	1.5	25.0
Dibromochloromethane	0.563	0.432	0.100	23.3	25.0
1,1,2-Trichloroethane	0.392	0.362	0.100	7.7	25.0
Benzene	0.973	0.966	0.500	0.7	25.0
trans-1,3-Dichloropropene	0.438	0.374	0.100	14.6	25.0
Bromoform	0.468	0.314	0.100	32.9	25.0
4-Methyl-2-Pentanone	0.443	0.482		-8.8	
2-Hexanone	0.285	0.292		-2.5	
Tetrachloroethene	0.464	0.407	0.200	12.3	25.0
1,1,2,2-Tetrachloroethane	0.912	0.687	0.500	24.7	25.0
Toluene	1.020	1.129	0.400	-10.7	25.0
Chlorobenzene	0.909	0.893	0.500	1.8	25.0
Ethylbenzene	0.360	0.407	0.100	-13.1	25.0
Styrene	0.777	0.805	0.300	-3.6	25.0
Xylenes (total)	0.454	0.482	0.300	-6.2	25.0
Toluene-d8	1.022	1.103		-7.9	
4-Bromofluorobenzene	0.921	0.764	0.200	17.0	25.0
1,2-Dichloroethane-d4	1.510	1.637		-8.4	

TRIP BLANK ~~1127~~ ~~1129~~ ~~1129~~ ~~1133~~

All other compounds must meet a minimum RRF of 0.010.

FORM VII VOA

11-7-94 1SH

~~3/90~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Triplblank ~~40337505~~ 6/5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) WATER Lab Sample ID: AA4257

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AA4257

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: not dec. ____ Date Analyzed: 03/23/94

GC Column: DB-624 ID: 0.530 (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	~~10~~ 2	BJ
67-64-1	Acetone	14	
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	Xylenes (total)	10	U

Q

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UJ

FORM I VOA

11-7-94 TOSW

~~3/90~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAB1

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 1218 SAS No.: _____ SDG No.: W0183

Matrix: (soil/water) SOIL Lab Sample ID: AB1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: WB0902

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

% Moisture: not dec. ____ Date Analyzed: 09/02/94

GC Column: DB624 ID: 0.530 (mm) Dilution Factor: 1.0

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

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

Reviewed 12/15/94

FORM I VOA

~~3/90~~ 11-28-94 KOSM

Unsent page

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RECORD COPY

NOV 1994

MEMORANDU[redacted]

TO: 200-UP-1 Round 1 Soil, Project QA Recor[redacted] November 28, 1994

FR: Diana Waterbury, Golder Associates Inc.

RE: SEMIVOLATILES DATA VALIDATION SUMMARY FOR
DATA PACKAGE: W0004-ITC-022, (943-1610.031, 022SVOA.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by the International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	SEMIVOLATILES	
B0BHZ6*	SOIL	SEMIVOLATILES	
B0BHZ7	SOIL	SEMIVOLATILES	
B0BHZ8	SOIL	SEMIVOLATILES	DUPLICATE OF B0BHZ7
		SEE ATTACHMENT 4	
* Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of four (4) samples were validated in this data package with a total of 256 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

OSW revised

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MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Continuing Calibration Verifcation

- The continuing calibration %D for 4-methylphenol, hexachlorobenzene, and benzo(k)fluoranthene, associated with samples B0BHZ5 and B0BHZ6, was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

FIELD QC

- Sample B0BHZ8 was identified as the field duplicate of sample B0BHZ7. All relative percent differences (%RPD) were within control limits. Qualification is not required based on field QC.

TENTATIVELY IDENTIFIED COMPOUNDS

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

- TICs were detected in the samples and associated laboratory blank and were common laboratory contaminants, resulting in qualification of the TICs as unusable (UR) as shown in Attachment 3.

- TICs were detected in the sample and identified as common laboratory contaminants, resulting in qualification of the results as unusable (R) as shown in Attachment 3.

- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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

- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

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

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

ATTACHMENT 2 - SUMMARY OF DATA QUALIFICATIONS

SDG: W0004-ITC-022	BY: D. Waterbury	DATE: 11/02/94	PAGE 1 OF 1
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
4 Methylphenol	UJ	B0BHZ5	Continuing calibration.
Hexachlorobenzene	UJ	B0BHZ5	Continuing calibration.
Benzo(k)fluoranthene	UJ	B0BHZ5	Continuing calibration.
4 Methylphenol	UJ	B0BHZ6	Continuing calibration.
Hexachlorobenzene	UJ	B0BHZ6	Continuing calibration.
Benzo(k)fluoranthene	UJ	B0BHZ6	Continuing calibration.

DSW revised

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	BOBHZ5		BOBHZ6		BOBHZ7		BOBHZ8	
	Date	3-7-94		3-8-94		3-16-94		3-16-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2-CHLOROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
1,3-DICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
1,4-DICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
1,2-DICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2-METHYLPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
4-METHYLPHENOL	UG/KG	380.000	UJ	360.000	UJ	340.000	U	340.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
HEXACHLOROETHANE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
NITROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
ISOPHORONE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2-NITROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,4-DIMETHYLPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,4-DICHLOROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
NAPHTHALENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
4-CHLOROANILINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
HEXACHLOROBUTADIENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2-METHYLNAPHTHALENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
2-CHLORONAPHTHALENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2-NITROANILINE	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
DIMETHYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
ACENAPHTHYLENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,6-DINITROTOLUENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
3-NITROANILINE	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
ACENAPHTHENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
2,4-DINITROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
4-NITROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
DIBENZOFURAN	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U

The decimal places shown do not reflect the precision reported by the laboratory

CSW

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CSW
Revised 6/6/96

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	B0BHZ5		B0BHZ6		B0BHZ7		B0BHZ8	
	Date	3-7-94		3-8-94		3-16-94		3-16-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROTOLUENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
DIETHYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
FLUORENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
4-NITROANILINE	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
N-NITROSODIPHENYLAMINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
HEXACHLOROBENZENE	UG/KG	380.000	UJ	360.000	UJ	340.000	U	340.000	U
PENTACHLOROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U
PHENANTHRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
ANTHRACENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
CARBAZOLE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
DI-N-BUTYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
FLUORANTHENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
PYRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BUTYLBENZYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BENZO(A)ANTHRACENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
CHRYSENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
DI-N-OCTYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BENZO(B)FLUORANTHENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BENZO(K)FLUORANTHENE	UG/KG	380.000	UJ	360.000	UJ	340.000	U	340.000	U
BENZO(A)PYRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U
BENZO(G,H,I)PERYLENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U

The decimal places shown do not reflect the precision reported by the laboratory

ASSY

ASSY revised page 0.10

9613474.1398

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ5AF
~~40321901AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3764

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA3764

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
106-44-5	4-Methylphenol	380	~~U~~ UJ
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	920	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	920	U
131-11-3	Dimethylphthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U
99-09-2	3-Nitroaniline	920	U
83-32-9	Acenaphthene	380	U

9613474.1400

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ5AF
~~40321901AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3764

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA3764

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	920	U
100-02-7	4-Nitrophenol	920	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	920	U
534-52-1	4,6-Dinitro-2-Methylphenol	920	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	~~U~~ UJ
87-86-5	Pentachlorophenol	920	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-Butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
56-55-3	Benzo(a)Anthracene	380	~~U~~ k
218-01-9	Chrysene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
117-84-0	Di-n-Octyl Phthalate	380	U KSW
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	~~U~~ UJ
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

KSW revised page 11-28-94

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ5

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3764

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA3764

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 14 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

Number TICs found: 8

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN	2.88	96	~~AJ~~	R
2.	UNKNOWN	3.25	160	~~AJ~~	UR
3. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	3.73	7300	~~ABJN~~	UR
4.	UNKNOWN	5.47	100	~~AJ~~	UR
5.	UNKNOWN PHTHALATE	16.60	130	~~J~~	R
6.	UNKNOWN	23.27	~~230~~	~~J~~	UR
7.	UNKNOWN	26.82	130	~~J~~	JN
8.	UNKNOWN	29.07	1500	~~J~~	JN

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ6AF
~~40321902AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3770

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA3770

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U UJ
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	360	U

9613479.1403

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ6AF
~~40321902AF~~
5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3770

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA3770

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	880	U	
100-02-7	4-Nitrophenol	880	U	
132-64-9	Dibenzofuran	360	U	
121-14-2	2,4-Dinitrotoluene	360	U	
84-66-2	Diethylphthalate	360	U	
7005-72-3	4-Chlorophenyl-phenylether	360	U	
86-73-7	Fluorene	360	U	
100-01-6	4-Nitroaniline	880	U	
534-52-1	4,6-Dinitro-2-Methylphenol	880	U	
86-30-6	N-Nitrosodiphenylamine (1)	360	U	
101-55-3	4-Bromophenyl-phenylether	360	U	
118-74-1	Hexachlorobenzene	360	~~U~~	=UJ
87-86-5	Pentachlorophenol	880	U	
85-01-8	Phenanthrene	360	U	
120-12-7	Anthracene	360	U	
86-74-8	Carbazole	360	U	
84-74-2	Di-n-Butylphthalate	360	U	
206-44-0	Fluoranthene	360	U	
129-00-0	Pyrene	360	U	
85-68-7	Butylbenzylphthalate	360	U	
91-94-1	3,3'-Dichlorobenzidine	360	U	
56-55-3	Benzo(a)Anthracene	360	~~U~~	
218-01-9	Chrysene	360	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	360	U	
117-84-0	Di-n-Octyl Phthalate	360	U	
205-99-2	Benzo(b)Fluoranthene	360	U	
207-08-9	Benzo(k)Fluoranthene	360	~~U~~	UJ
50-32-8	Benzo(a)Pyrene	360	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U	
53-70-3	Dibenz(a,h)Anthracene	360	U	
191-24-2	Benzo(g,h,i)Perylene	360	U	

(1) - Cannot be separated from Diphenylamine

OSW revised page 11-28-94

015

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ6

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA3770

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA3770

Level: (low/med) LOW Date Received: 03/12/94

% Moisture: 9 decanted: (Y/N) N Date Extracted: 03/18/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 03/30/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN	3.23	110	~~AJ~~	UR
2. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	3.72	5300	~~ABJN~~	UR
3.	UNKNOWN	5.45	77	~~AJ~~	UR
4. 74381-40-1	PROPANOIC ACID, 2-METHYL-, 1	13.87	100	JN	
5.	UNKNOWN PHTHALATE	16.58	230	~~J~~	R
6.	UNKNOWN	23.25	220	~~J~~	UJN

9613474.1405

0000003 NSN

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ7AF
~~40337501AF~~
5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4244

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4244

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U

NSN revised page 11-28-94

017

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBHZ7AF
~~40337501AF~~
Bg 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4244

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4244

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	820	U
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-Methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	340	U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ7

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4244

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4244

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.7

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	4.97	6500	AJN

Q

R

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

30BHZ8AF
~~40337504AF~~
BG 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4252

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA4252

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-Di-n-Propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)Methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	820	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	820	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	820	U
83-32-9	Acenaphthene	340	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBH28AF
~~40337504AF~~
AG 5-20-94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4252

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA4252

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	820	U
100-02-7	4-Nitrophenol	820	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	820	U
534-52-1	4,6-Dinitro-2-Methylphenol	820	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	820	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-Butylphthalate	340	U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)Anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)Phthalate	340	U
117-84-0	Di-n-Octyl Phthalate	340	U
205-99-2	Benzo(b)Fluoranthene	340	U
207-08-9	Benzo(k)Fluoranthene	340	U
50-32-8	Benzo(a)Pyrene	340	U
193-39-5	Indeno(1,2,3-cd)Pyrene	340	U
53-70-3	Dibenz(a,h)Anthracene	340	U
191-24-2	Benzo(g,h,i)Perylene	340	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBHZ8

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Matrix: (soil/water) SOIL Lab Sample ID: AA4252

Sample wt/vol: 30.2 (g/mL) G Lab File ID: AA4252

Level: (low/med) LOW Date Received: 03/19/94

% Moisture: 3 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN	4.87	110	AJ	R
2. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	4.98	6600	AJN	R

9613474.1411

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 22 , 1994

Job Number: 204 & 234

This is the Certificate of Analysis for the following samples:

SDG:	W0004
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	03/12/94 & 03/19/94
Number of Samples:	Seven (7)
Sample Type:	Soil - six (6), Water - one (1)

I. Introduction

On March 12 and March 19, 1994, six (6) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

III. Quality Control

The volatile analyses were performed March 14-15, March 23 and March 26, 1994 by purge and trap with a J & W DB-624 column on Hewlett-Packard 5970 and Finnigan INCOS 500 GC/MS/DS units. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

The semivolatile analyses were performed March 29-30 and April 5-6, 1994 by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS unit. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

The samples were digested on April 1, 1994 for ICP and March 31, 1994 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on April 1, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from March 31 through April 2, 1994; the remaining metals were analyzed by ICP on April 2, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBHZ5. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for antimony by ICP analysis and selenium by GFAA analysis. A post digestion spike was performed for antimony as required by CLP protocol. As the lead and titanium concentrations were greater than four times (4X) the spike added, spiking criteria did not apply for these analytes. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses. MSAs were performed as required by CLP protocol.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

III. Quality Control (Continued)

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

On March 29, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C). Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

The samples were analyzed for anions from March 26 through April 2, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Matrix	Test
AA3763	4-03-219-01A	BOBHZ5	SOIL	VOC
AA3764	4-03-219-01B	BOBHZ5	SOIL	SVOC
AA3765	4-03-219-01C	BOBHZ5	SOIL	METALS
AA3766	4-03-219-01D	BOBHZ5	SOIL	CN
AA3767	4-03-219-01E	BOBHZ5	SOIL	ANIONS
AA3768	4-03-219-01F	BOBHZ5	SOIL	NO3NO2
AA3769	4-03-219-02A	BOBHZ6	SOIL	VOC
AA3770	4-03-219-02B	BOBHZ6	SOIL	SVOC
AA3771	4-03-219-02C	BOBHZ6	SOIL	METALS
AA3772	4-03-219-02D	BOBHZ6	SOIL	CN
AA3773	4-03-219-02E	BOBHZ6	SOIL	ANIONS
AA3774	4-03-219-02F	BOBHZ6	SOIL	NO3NO2
AA4243	4-03-375-01A	BOBHZ7	SOIL	VOC
AA4244	4-03-375-01B	BOBHZ7	SOIL	SVOC
AA4245	4-03-375-01C	BOBHZ7	SOIL	METALS
AA4246	4-03-375-01D	BOBHZ7	SOIL	CN
AA4247	4-03-375-01E	BOBHZ7	SOIL	ANIONS
AA4248	4-03-375-01F	BOBHZ7	SOIL	NO3NO2
AA4249	4-03-375-02A	BOBJOO	SOIL	VOC
AA4250	4-03-375-03A	BOBHZ9	SOIL	VOC
AA4251	4-03-375-04A	BOBHZ8	SOIL	VOC
AA4252	4-03-375-04B	BOBHZ8	SOIL	SVOC
AA4253	4-03-375-04C	BOBHZ8	SOIL	METALS
AA4254	4-03-375-04D	BOBHZ8	SOIL	CN
AA4255	4-03-375-04E	BOBHZ8	SOIL	ANIONS
AA4256	4-03-375-04F	BOBHZ8	SOIL	NO3NO2
AA4257	4-03-375-05A	Trip Blank	WATER	VOC
AA4257	4-03-375-05B	Trip Blank	WATER	VOC

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree A Schneider

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SAMPLE ANALYSIS																	
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Sample No. / Matrix* / Date Sampled / Time Sampled															
BOBHZ5 / S / 3-7-94 / 1315	X	X	X	X	X	X	X	X							
40321901A-F															

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1340 3-10-94	Received By: Heidelberg	Date/Time: 3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

H0322001-Rad.

SDL W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample ; Yellow - Sampler

BC-6000-828 (12/92)

WO #204

9613474.1118

030

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SAMPLE ANALYSIS																	
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)				1	1	1	1	1	1	1	1					1		
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
				VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Sample No.	Matrix*	Date Sampled	Time Sampled															
BOBH26	S	3-8-94	1405	X	X	X	X	X	X	X	X							
40321902A-F																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 3-8-94 1526	Received By: R. J. Stull	Date/Time: 3/8/94 1526
Relinquished By: R. J. Stull	Date/Time: 3/9/94 0905	Received By: W. V. Setzer	Date/Time: 3/9/94 0906
Relinquished By: W. V. Setzer	Date/Time: 1540 3/10/94	Received By: Hendelke	Date/Time: 3/10 14B
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322002-Rad.

SDG W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9413474.1419

WO# 204

0000025-

031

WO#234

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnarpund: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~045~~ 045 WVS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED	Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE	

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	cool 4	
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	aGs	
No. of Container(s)	1	1	1	1	1	1	1	1					1	1	
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml	
SAMPLE ANALYSIS 403375	VOA (CLP) A	SEMIVOA (CLP) B	ICP MTL GFAA METALS Hg (CLP) C	Cn (CLP) D	ANIONS IC-F,CL SO4,NO2 NO3,PO4 E	NO2,NO3 EPA(353.2) F	*1	*1					VOA TRIP (CLP)	VOA (Field)	

	Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F									
1	BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X							
2	BOBJ00	S	3-16-94	0915													X		
3	BOBHZ9	S	3-16-94	1340														X	
4	BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	3-18-94 1200	R. Bayd	3/18/94 1210

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204). C-14 (ITAS-RD-3247). Tc-99 (ITAS-IT-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original Sample Yellow - Sampler

HC-6000-828 (12/92)

9413174.1420

032

9613474.1421

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: W0004 ITC 022	DATA PACKAGE:	
VALIDATOR: WATERBURY	LAB: IT	DATE: 10.2.94
CASE:	SDG: W0004	

ANALYSES PERFORMED

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

SAMPLES/MATRIX
BOBHZ5 - soil
BOBHZ6 - soil
BOBHZ7 - soil
BOBHZ8 - soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: SEE ATTACHMENT B-1

034

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

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

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

Comments: Continuing calibration for samples B0BHZ5 and B0BHZ6 required qualification of data.

4. BLANKS

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

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

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

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

Comments:

5. ACCURACY

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

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

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

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

Comments:

OSK revised page 035

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

Are field split RPD values acceptable? . . . . . Yes No N/A 2

Comments: (1) Sample B0BHZ8 is field duplicate of sample B0BHZ7.

(2) No field split data given.

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

Comments:

036

HOLDING TIME SUMMARY

SDG: W0004 | VALIDATOR: WATERBURY | DATE: 1 | PAGE 1 OF 1

COMMENTS: SEMIVOLATILE

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BHZ5	SVOC	3·7·94	3·18·94	3·30·94	11	12	none
B0BHZ6	SVOC	3·8·94	3·18·94	3·30·94	10	12	none
B0BHZ7	SVOC	3·16·94	3·29·94	4·6·94	13	8	none
B0BHZ8	SVOC	3·16·94	3·29·94	4·6·94	13	8	none

9613474.1425

9613474.1426

0000534 RSW

6C
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Instrument ID: 4500 Calibration Date(s): 03/25/94 03/25/94

Calibration Times: 1613 1903

LAB FILE ID: RRF20 = BIC0325E RRF50 = BCC0325
RRF80 = BIC0325C RRF120= BIC0325B RRF160= BIC0325A

COMPOUND		RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Fluorene	*	1.438	1.368	1.312	1.201	1.112	1.286	10.1*
4-Nitroaniline			0.438	0.477	0.477	0.476	0.467	4.1
4,6-Dinitro-2-Methylphenol			0.076	0.092	0.091	0.088	0.087	8.5
N-Nitrosodiphenylamine (1)		0.585	0.569	0.535	0.476	0.440	0.521	11.8
4-Bromophenyl-phenylether	*	0.189	0.195	0.181	0.172	0.164	0.180	7.0*
Hexachlorobenzene	*	0.200	0.207	0.189	0.178	0.170	0.189	8.1*
Pentachlorophenol	*		0.135	0.124	0.131	0.136	0.132	4.1*
Phenanthrene	*	1.244	1.216	1.152	1.031	0.967	1.122	10.6*
Anthracene	*	1.230	1.112	1.058	0.953	0.873	1.045	13.3*
Carbazole		1.207	1.148	1.104	1.003	0.939	1.080	10.0
Di-n-Butylphthalate		1.667	1.576	1.539	1.352	1.276	1.482	11.0
Fluoranthene	*	1.373	1.302	1.242	1.104	1.021	1.208	11.9*
Pyrene	*	1.309	1.358	1.301	1.180	1.091	1.248	8.8*
Butylbenzylphthalate		0.723	0.756	0.783	0.728	0.665	0.731	6.0
3,3'-Dichlorobenzidine		0.437	0.423	0.447	0.404	0.349	0.412	9.4
Benzo(a)Anthracene	*	1.243	1.153	1.035	0.857	0.730	1.004	21.0*
Chrysene	*	1.179	1.147	1.097	0.971	0.881	1.055	11.9*
bis(2-Ethylhexyl)Phthalate		0.999	0.939	0.894	0.758	0.649	0.848	16.8
Di-n-Octyl Phthalate		1.627	1.610	1.570	1.386	1.256	1.490	10.9
Benzo(b)Fluoranthene	*	1.113	1.150	1.275	1.080	0.942	1.112	10.8*
Benzo(k)Fluoranthene	*	1.375	1.236	0.905	0.790	0.719	1.005	28.5*
Benzo(a)Pyrene	*	1.026	1.016	0.954	0.847	0.773	0.923	11.9*
Indeno(1,2,3-cd)Pyrene	*	1.138	1.159	1.017	0.912	0.843	1.014	13.6*
Dibenz(a,h)Anthracene	*	0.913	0.911	0.810	0.710	0.641	0.797	15.2*
Benzo(g,h,i)Perylene	*	0.967	1.067	0.961	0.908	0.853	0.951	8.4*
Nitrobenzene-d5	*	0.424	0.421	0.397	0.387	0.388	0.403	4.4*
2-Fluorobiphenyl	*	1.391	1.369	1.282	1.234	1.151	1.285	7.7*
Terphenyl-d14	*	0.918	0.914	0.840	0.752	0.693	0.823	12.1*
Phenol-d5	*	2.087	2.187	2.112	1.987	1.999	2.074	4.0*
2-Fluorophenol	*	1.290	1.462	1.423	1.377	1.425	1.395	4.7*
2,4,6-Tribromophenol		0.136	0.155	0.148	0.151	0.158	0.150	5.7
2-Chlorophenol-d4	*	1.495	1.557	1.504	1.435	1.412	1.481	3.9*
1,2-Dichlorobenzene-d4	*	0.970	0.950	0.891	0.831	0.805	0.889	8.1*

(1) Cannot be separated from Diphenylamine
* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

RSW 11-7-94

H25
H26
H25 11/5/90
H25 11/30

FORM VI SV-2

038

6B
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Instrument ID: FINN Calibration Date(s): 04/05/94 04/05/94

Calibration Times: 1712 1938

LAB FILE ID: RRF20 = IC04051 RRF50 = IC04052
RRF80 = IC04053 RRF120= IC04054 RRF160= IC04055

COMPOUND	RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Phenol *	1.347	1.747	1.886	1.996	2.332	1.862	19.3*
bis(2-Chloroethyl)Ether *	1.079	1.335	1.346	1.393	1.555	1.342	12.8*
2-Chlorophenol *	1.129	1.367	1.341	1.311	1.329	1.295	7.4*
1,3-Dichlorobenzene *	1.286	1.401	1.361	1.359	1.351	1.352	3.1*
1,4-Dichlorobenzene *	1.358	1.528	1.490	1.382	1.358	1.423	5.6*
1,2-Dichlorobenzene *	1.153	1.346	1.292	1.248	1.219	1.252	5.8*
2-Methylphenol *	0.888	1.079	1.051	1.025	1.014	1.011	7.3*
2,2'-oxybis(1-Chloropropane	1.268	1.386	1.397	1.423	1.483	1.391	5.6
4-Methylphenol *	0.790	0.971	0.979	1.036	1.040	0.963	10.6*
N-Nitroso-Di-n-Propylamine *	0.721	0.835	0.844	0.833	0.937	0.834	9.2*
Hexachloroethane *	0.513	0.570	0.579	0.594	0.630	0.577	7.4*
Nitrobenzene *	0.413	0.484	0.499	0.521	0.578	0.499	12.0*
Isophorone *	0.761	0.909	0.964	0.979	1.026	0.928	11.0*
2-Nitrophenol *	0.192	0.227	0.237	0.247	0.261	0.233	11.2*
2,4-Dimethylphenol *	0.337	0.422	0.451	0.481	0.502	0.439	14.7*
bis(2-Chloroethoxy)Methane *	0.381	0.465	0.498	0.526	0.529	0.480	12.7*
2,4-Dichlorophenol *	0.285	0.344	0.357	0.386	0.378	0.350	11.4*
1,2,4-Trichlorobenzene *	0.353	0.409	0.412	0.419	0.423	0.403	7.1*
Naphthalene *	0.909	1.076	1.117	1.171	1.129	1.080	9.4*
4-Chloroaniline	0.248	0.308	0.339	0.371	0.419	0.337	19.1
Hexachlorobutadiene	0.229	0.264	0.276	0.274	0.281	0.265	7.9
4-Chloro-3-Methylphenol *	0.259	0.347	0.387	0.435	0.472	0.380	21.7*
2-Methylnaphthalene *	0.636	0.823	0.878	0.885	0.946	0.834	14.2*
Hexachlorocyclopentadiene	0.320	0.386	0.440	0.483	0.514	0.429	18.0
2,4,6-Trichlorophenol *	0.375	0.456	0.474	0.488	0.496	0.458	10.6*
2,4,5-Trichlorophenol *		0.443	0.437	0.465	0.472	0.454	3.7*
2-Chloronaphthalene *	1.017	1.162	1.163	1.190	1.214	1.149	6.7*
2-Nitroaniline		0.390	0.411	0.451	0.488	0.435	10.0
Dimethylphthalate	1.145	1.316	1.302	1.327	1.383	1.295	6.9
Acenaphthylene *	1.569	1.699	1.728	1.787	1.688	1.694	4.7*
2,6-Dinitrotoluene *	0.243	0.299	0.307	0.325	0.335	0.302	11.9*
Acenaphthene *	0.900	1.017	1.033	1.012	1.061	1.005	6.1*
2,4-Dinitrophenol		0.112	0.130	0.145	0.162	0.137	15.6
4-Nitrophenol		0.116	0.134	0.154	0.169	0.143	16.2
Dibenzofuran *	1.371	1.553	1.526	1.556	1.610	1.523	5.9*
2,4-Dinitrotoluene *	0.287	0.342	0.341	0.359	0.385	0.343	10.5*
Diethylphthalate	1.072	1.231	1.249	1.305	1.350	1.241	8.5

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

HZ7
HZ8

OSW 3/31-94
~~3/96~~

6C
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 234 SAS No.: _____ SDG No.: W0004

Instrument ID: FINN Calibration Date(s): 04/05/94 04/05/94

Calibration Times: 1712 1938

LAB FILE ID: RRF20 = IC04051 RRF50 = IC04052
RRF80 = IC04053 RRF120= IC04054 RRF160= IC04055

COMPOUND	RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
4-Chlorophenyl-phenylether *	0.620	0.699	0.708	0.708	0.735	0.694	6.3*
Fluorene *	1.103	1.233	1.219	1.200	1.240	1.199	4.7*
4-Nitroaniline		0.096	0.089	0.080	0.061	0.082	18.5
4,6-Dinitro-2-Methylphenol		0.141	0.145	0.152	0.145	0.146	3.1
N-Nitrosodiphenylamine (1)	0.542	0.540	0.506	0.508	0.455	0.510	6.9
4-Bromophenyl-phenylether *	0.262	0.297	0.296	0.294	0.294	0.289	5.2*
Hexachlorobenzene *	0.287	0.306	0.297	0.297	0.301	0.298	2.3*
Pentachlorophenol *		0.172	0.181	0.189	0.192	0.184	4.9*
Phenanthrene *	1.080	1.199	1.142	1.133	1.133	1.137	3.7*
Anthracene *	1.024	1.140	1.083	1.079	1.077	1.081	3.8*
Carbazole	0.769	0.777	0.670	0.625	0.530	0.674	15.3
Di-n-Butylphthalate	1.169	1.479	1.464	1.517	1.474	1.421	10.0
Fluoranthene *	1.016	1.177	1.146	1.149	1.136	1.125	5.6*
Pyrene *	1.162	1.239	1.151	1.109	1.109	1.154	4.6*
Butylbenzylphthalate	0.570	0.731	0.734	0.753	0.758	0.709	11.1
3,3'-Dichlorobenzidine	0.350	0.384	0.371	0.334	0.309	0.350	8.5
Benzo(a)Anthracene *	1.108	1.141	1.038	0.942	0.898	1.025	10.2*
Chrysene *	1.108	1.034	0.919	0.858	0.787	0.941	13.8*
bis(2-Ethylhexyl)Phthalate	0.851	1.116	1.100	1.102	1.112	1.056	10.9
Di-n-Octyl Phthalate	1.235	1.527	1.454	1.421	1.367	1.401	7.8
Benzo(b)Fluoranthene *	1.058	1.148	1.172	1.102	0.959	1.088	7.7*
Benzo(k)Fluoranthene *	1.234	1.335	1.062	0.962	0.981	1.115	14.6*
Benzo(a)Pyrene *	0.891	1.017	0.962	0.932	0.890	0.938	5.7*
Indeno(1,2,3-cd)Pyrene *	0.774	0.974	0.998	1.019	1.018	0.957	10.8*
Dibenz(a,h)Anthracene *	0.582	0.764	0.794	0.814	0.861	0.763	14.0*
Benzo(g,h,i)Perylene *	0.680	0.865	0.881	0.904	0.913	0.849	11.3*
Nitrobenzene-d5 *	0.434	0.484	0.508	0.526	0.566	0.504	9.7*
2-Fluorobiphenyl *	1.325	1.357	1.317	1.298	1.296	1.319	1.9*
Terphenyl-d14 *	0.881	0.871	0.825	0.784	0.760	0.824	~~6.4*~~
Phenol-d5 *	1.481	1.822	2.047	2.244	2.721	2.063	22.5*
2-Fluorophenol *	1.495	1.740	1.931	2.048	2.528	1.948	19.8*
2,4,6-Tribromophenol	0.139	0.150	0.151	0.153	0.150	0.149	3.7
2-Chlorophenol-d4 *	1.323	1.491	1.518	1.517	1.589	1.488	6.7*
1,2-Dichlorobenzene-d4 *	0.821	0.910	0.897	0.896	0.928	0.890	4.6*

(1) Cannot be separated from Diphenylamine
* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

RSN 11-7-94

9613474.1429

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Instrument ID: 4500 Calibration date: 03/29/94 Time: 1955

Lab File ID: BCC0329 Init. Calib. Date(s): 03/25/94 03/25/94

Init. Calib. Times: 1613 1903

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Phenol	2.116	2.109	0.800	0.3	25.0
bis(2-Chloroethyl)Ether	1.675	1.683	0.700	-0.5	25.0
2-Chlorophenol	1.421	1.482	0.800	-4.3	25.0
1,3-Dichlorobenzene	1.458	1.557	0.600	-6.8	25.0
1,4-Dichlorobenzene	1.483	1.610	0.500	-8.6	25.0
1,2-Dichlorobenzene	1.369	1.531	0.400	-11.8	25.0
2-Methylphenol	1.568	1.476	0.700	5.9	25.0
2,2'-oxybis(1-Chloropropane)	2.833	3.204		-13.1	
4-Methylphenol	1.561	2.035	0.600	-30.4	25.0
N-Nitroso-Di-n-Propylamine	0.996	1.128	0.500	-13.2	25.0
Hexachloroethane	0.573	0.604	0.300	-5.4	25.0
Nitrobenzene	0.411	0.417	0.200	-1.5	25.0
Isophorone	0.788	0.778	0.400	1.3	25.0
2-Nitrophenol	0.189	0.181	0.100	4.2	25.0
2,4-Dimethylphenol	0.345	0.345	0.200	0.0	25.0
bis(2-Chloroethoxy)Methane	0.519	0.521	0.300	-0.4	25.0
2,4-Dichlorophenol	0.278	0.295	0.200	-6.1	25.0
1,2,4-Trichlorobenzene	0.277	0.305	0.200	-10.1	25.0
Naphthalene	1.001	1.074	0.700	-7.3	25.0
4-Chloroaniline	0.447	0.467		-4.5	
Hexachlorobutadiene	0.127	0.146		-15.0	
4-Chloro-3-Methylphenol	0.354	0.371	0.200	-4.8	25.0
2-Methylnaphthalene	0.691	0.766	0.400	-10.8	25.0
Hexachlorocyclopentadiene	0.243	0.083		65.8	
2,4,6-Trichlorophenol	0.373	0.365	0.200	2.1	25.0
2,4,5-Trichlorophenol	0.431	0.458	0.200	-6.3	25.0
2-Chloronaphthalene	1.208	1.245	0.800	-3.1	25.0
2-Nitroaniline	0.549	0.543		1.1	
Dimethylphthalate	1.452	1.510		-4.0	
Acenaphthylene	1.958	2.039	1.300	-4.1	25.0
2,6-Dinitrotoluene	0.326	0.336	0.200	-3.1	25.0
3-Nitroaniline	0.417	0.407		2.4	
Acenaphthene	1.223	1.307	0.800	-6.9	25.0
2,4-Dinitrophenol	0.087	0.040		54.0	
4-Nitrophenol	0.142	0.102		28.2	
Dibenzofuran	1.765	1.914	0.800	-8.4	25.0
2,4-Dinitrotoluene	0.495	0.518	0.200	-4.6	25.0

All other compounds must meet a minimum RRF of 0.010.

CSW 11-7-94

7C
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 204 SAS No.: _____ SDG No.: W0004

Instrument ID: 4500 Calibration date: 03/29/94 Time: 1955

Lab File ID: BCC0329 Init. Calib. Date(s): 03/25/94 03/25/94

Init. Calib. Times: 1613 1903

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Diethylphthalate	1.526	1.600		-4.8	
4-Chlorophenyl-phenylether	0.562	0.676	0.400	-20.3	25.0
Fluorene	1.286	1.457	0.900	-13.3	25.0
4-Nitroaniline	0.467	0.443		5.1	
4,6-Dinitro-2-Methylphenol	0.087	0.082		5.7	
N-Nitrosodiphenylamine (1)	0.521	0.555		-6.5	
4-Bromophenyl-phenylether	0.180	0.213	0.100	-18.3	25.0
Hexachlorobenzene	0.189	0.244	0.100	-29.1	25.0
Pentachlorophenol	0.132	0.101	0.050	23.5	25.0
Phenanthrene	1.122	1.218	0.700	-8.6	25.0
Anthracene	1.045	1.205	0.700	-15.3	25.0
Carbazole	1.080	1.148		-6.3	
Di-n-Butylphthalate	1.482	1.633		-10.2	
Fluoranthene	1.208	1.426	0.600	-18.0	25.0
Pyrene	1.248	1.308	0.600	-4.8	25.0
Butylbenzylphthalate	0.731	0.748		-2.3	
3,3'-Dichlorobenzidine	0.412	0.486		-18.0	
Benzo(a)Anthracene	1.004	1.110	0.800	-10.6	25.0
Chrysene	1.055	1.130	0.700	-7.1	25.0
bis(2-Ethylhexyl)Phthalate	0.848	0.936		-10.4	
Di-n-Octyl Phthalate	1.490	1.855		-24.5	
Benzo(b)Fluoranthene	1.112	1.179	0.700	-6.0	25.0
Benzo(k)Fluoranthene	1.005	1.378	0.700	-37.1	25.0
Benzo(a)Pyrene	0.923	1.044	0.700	-13.1	25.0
Indeno(1,2,3-cd)Pyrene	1.014	1.067	0.500	-5.2	25.0
Dibenz(a,h)Anthracene	0.797	0.872	0.400	-9.4	25.0
Benzo(g,h,i)Perylene	0.951	0.933	0.500	1.9	25.0
Nitrobenzene-d5	0.403	0.400	0.200	0.7	25.0
2-Fluorobiphenyl	1.285	1.325	0.700	-3.1	25.0
Terphenyl-d14	0.823	0.956	0.500	-16.2	25.0
Phenol-d5	2.074	1.995	0.800	3.8	25.0
2-Fluorophenol	1.395	0.864	0.600	38.1	25.0
2,4,6-Tribromophenol	0.150	0.169		-12.7	
2-Chlorophenol-d4	1.481	1.503	0.800	-1.5	25.0
1,2-Dichlorobenzene-d4	0.889	0.962	0.400	-8.2	25.0

(1) Cannot be separated from Diphenylamine
All other compounds must meet a minimum RRF of 0.010.

11-7-94 ASH

9613474.1431

RECORD COPY

MEMORANDUM

TO: 200-UP-1 Project QA Record

November 4, 1994

FR: Diana Waterbury, Golder Associates Inc. DSW

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0004-ITC-022 (943-1610.031 022GEN.UP1)

NOV 1994 RECEIVED Validation Log In

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	GENERAL CHEMISTRY	
B0BHZ6*	SOIL		
B0BHZ7	SOIL		
B0BHZ8	SOIL		DUPLICATE OF B0BHZ7
		SEE ATTACHMENT 4	
* Indicates the sample results which were 100% validated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiency identified below.

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

Detection Limits. Detection limit goals were met.

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

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiency was identified during data validation which required qualification of data.

Matrix Spike Recovery

- The matrix spike recovery for fluoride was unacceptable. Attachments 2 and 5 provide a summary of the data qualification appled and supporting documentation.

FIELD QC

- Sample B0BHZ8 was identified as the field duplicate of sample B0BHZ7. All relative percent differences (%RPD) were within control limits. Qualification is not required based on field QC.

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

WHC 1993, Data Validation Procedures for Chmeical Analyses, WHC-SD-EN-SPP-022, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

OSW revised page 002 11-23-94

9613474.1433

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected. Due to a minor quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the CRDL but greater then the IDL. Due to a minor quality control deficiency identified during data validation, The associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9613474.1435

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0004-ITC-022	REVIEWER: D. WATERBURY	DATE: 10-30-94	PAGE 1 OF 1
COMMENTS: WET CHEMISTRY			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
FLUORIDE	J	B0BHZ5	SPIKE % RECOVERY

9613474.1437

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	B0BHZ5		B0BHZ6		B0BHZ7		B0BHZ8	
	Date	3-7-94		3-8-94		3-16-94		3-16-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
FLUORIDE	MG/KG	0.930	J	0.400	U	0.400	U	0.400	U
CHLORIDE	MG/KG	3.600		0.700		0.400	U	0.400	U
NITRITE	MG/KG	0.400	U	0.400	U	0.400	U	0.400	U
BROMIDE	MG/KG	1.000	U	1.000	U	1.000	U	1.000	U
NITRATE	MG/KG	0.400	U	0.400	U	0.400	U	0.400	U
PHOSPHATE	MG/KG	1.000	U	1.000	U	1.000	U	1.000	U
SULFATE	MG/KG	24.000		27.000		2.900		3.400	
NITRATE+NITRITE	MG/KG	12.000		13.000		2.500	U	2.500	U

The decimal places shown do not reflect the precision reported by the laboratory

DSH
revised
page
11-28-94

9513974.1438

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Client Sample ID:	~~4-03-219-02E~~ B0BH26 5-23-94	Analysis Date:	03/26/94
Lab Sample ID:	AA3773	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
chloride	0.70	+	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	27	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Client Sample ID:	~~4-03-319-01E~~ BOBHZ5	Analysis Date:	03/27/94
Lab Sample ID:	AA3767 bg 5-23-94	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.93	~~+~~ J	0.4
chloride	3.6	+	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	24	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

OSW revised page 23-94

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	234
Client Sample ID:	~~4-03-375-01E~~ BCBHZ7	Analysis Date:	03/29/94
Lab Sample ID:	AA4247 BJ 5-23-94	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
chloride	0.4	U	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	2.9	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9613474.1442

~~0001201~~ OSW

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	234
Client Sample ID:	~~4-03-375-04E~~ BOBH28	Analysis Date:	03/29/94
Lab Sample ID:	AA4255	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
chloride	0.4	U	0.4
nitrite	0.4	U	0.4
bromide	1.0	U	1.0
nitrate	0.4	U	0.4
phosphate	1.0	U	1.0
sulfate	3.4	+	1.5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg (ppm)	Analysis Date:	03/29/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6063	2.5	U
5-23-94 ~~4-03-219-01F~~ BOBHZ5	AA3768	12	+
~~4-03-219-02F~~ BOBHZ6	AA3774	13	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	234
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg (ppm)	Analysis Date:	03/29/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6063	2.5	U
5-23-94 ~~4-03-375-01E~~ BOBH 27	AA4248	2.5	U
~~4-03-375-04E~~ BOBH 28	AA4256	2.5	U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9613474.1445

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 22 , 1994

Job Number: 204 & 234

This is the Certificate of Analysis for the following samples:

SDG:	W0004
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	03/12/94 & 03/19/94
Number of Samples:	Seven (7)
Sample Type:	Soil - six (6), Water - one (1)

I. Introduction

On March 12 and March 19, 1994, six (6) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

III. Quality Control

The volatile analyses were performed March 14-15, March 23 and March 26, 1994 by purge and trap with a J & W DB-624 column on Hewlett-Packard 5970 and Finnigan INCOS 500 GC/MS/DS units. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

The semivolatile analyses were performed March 29-30 and April 5-6, 1994 by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS unit. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

III. Quality Control (Continued)

The samples were digested on April 1, 1994 for ICP and March 31, 1994 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on April 1, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from March 31 through April 2, 1994; the remaining metals were analyzed by ICP on April 2, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBHZ5. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for antimony by ICP analysis and selenium by GFAA analysis. A post digestion spike was performed for antimony as required by CLP protocol. As the lead and titanium concentrations were greater than four times (4X) the spike added, spiking criteria did not apply for these analytes. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses. MSAs were performed as required by CLP protocol.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

III. Quality Control (Continued)

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

On March 29, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C). Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

The samples were analyzed for anions from March 26 through April 2, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Matrix	Test
AA3763	4-03-219-01A	BOBHZ5	SOIL	VOC
AA3764	4-03-219-01B	BOBHZ5	SOIL	SVOC
AA3765	4-03-219-01C	BOBHZ5	SOIL	METALS
AA3766	4-03-219-01D	BOBHZ5	SOIL	CN
AA3767	4-03-219-01E	BOBHZ5	SOIL	ANIONS
AA3768	4-03-219-01F	BOBHZ5	SOIL	NO3NO2
AA3769	4-03-219-02A	BOBHZ6	SOIL	VOC
AA3770	4-03-219-02B	BOBHZ6	SOIL	SVOC
AA3771	4-03-219-02C	BOBHZ6	SOIL	METALS
AA3772	4-03-219-02D	BOBHZ6	SOIL	CN
AA3773	4-03-219-02E	BOBHZ6	SOIL	ANIONS
AA3774	4-03-219-02F	BOBHZ6	SOIL	NO3NO2
AA4243	4-03-375-01A	BOBHZ7	SOIL	VOC
AA4244	4-03-375-01B	BOBHZ7	SOIL	SVOC
AA4245	4-03-375-01C	BOBHZ7	SOIL	METALS
AA4246	4-03-375-01D	BOBHZ7	SOIL	CN
AA4247	4-03-375-01E	BOBHZ7	SOIL	ANIONS
AA4248	4-03-375-01F	BOBHZ7	SOIL	NO3NO2
AA4249	4-03-375-02A	BOBJOO	SOIL	VOC
AA4250	4-03-375-03A	BOBHZ9	SOIL	VOC
AA4251	4-03-375-04A	BOBHZ8	SOIL	VOC
AA4252	4-03-375-04B	BOBHZ8	SOIL	SVOC
AA4253	4-03-375-04C	BOBHZ8	SOIL	METALS
AA4254	4-03-375-04D	BOBHZ8	SOIL	CN
AA4255	4-03-375-04E	BOBHZ8	SOIL	ANIONS
AA4256	4-03-375-04F	BOBHZ8	SOIL	NO3NO2
AA4257	4-03-375-05A	Trip Blank	WATER	VOC
AA4257	4-03-375-05B	Trip Blank	WATER	VOC

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-3.5	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		

Sample No.	Matrix*	Date Sampled	Time Sampled															
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)				1	1	1	1	1	1	1	1					1		
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS				VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
BOAHZ5	5	3-7-94	1315	X	X	X	X	X	X	X	X							
40321901A-F																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1340 3-10-94	Received By: Heidelberg	Date/Time: 3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

H0322001-Rad.

SDL W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample ; Yellow - Sampler

BC-6000-828 (12/92)

WO #204

9613474.1452

022

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369 # 14	Bill of Lading/Air Bill No.:
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Possible Sample Hazards/Remarks: NONE OBSERVED

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)						VOA TRIP (CLP)		
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	
No. of Container(s)				1	1	1	1	1	1	1	1					1	
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	
SAMPLE ANALYSIS										*1	*1						
BOBH36	S	3-8-94	1405	X	X	X	X	X	X	X	X						
40321902A-F																	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1526 3-8-94	Received By: R. J. Stull	Date/Time: 3/8/94 1526
Relinquished By: R. J. Stull	Date/Time: 3/9/94 0905	Received By: W. V. Setzer	Date/Time: 3/9/94 0906
Relinquished By: W. V. Setzer	Date/Time: 1540 3/10/94	Received By: Hendelberg	Date/Time: 3/10 1430
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322002-Rad.

SDG W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613474.1453

WO# 204

CZ000000-OSW

023

WO#234

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnarpund: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~045~~ 045 WJS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	cool 4	
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	aGs	
No. of Container(s)	1	1	1	1	1	1	1	1					1	1	
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml	
SAMPLE ANALYSIS 403375	VOA (CLP) A	SEMIVOA (CLP) B	ICP MTL GFAA METALS Hg (CLP) C	Cn (CLP) D	ANIONS IC-F,CL SO4,NO2 NO3,PO4 E	NO2,NO3 EPA(353.2) F	*1	*1					VOA TRIP (CLP)	VOA (Field)	

	Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F								
11	BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X						
12	BOBJ00	S	3-16-94	0915												X		
13	BOBHZ9	S	3-16-94	1340													X	
14	BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	3-18-94 1200	R. Boyd JT	3/18/94 1210

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION: Received By | Title | Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

DISTRIBUTION: Original Sample Yellow - Sampler

BC-6000-828 (12/92)

024

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E

PROJECT: 200-UP-1	DATA PACKAGE: W0004-ITC-022
VALIDATOR: WATERBURY / LAB: IT	DATE: 10.24.94
CASE:	SDG: W0004

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☒ NO_2/NO_3
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX
B0BHZ5 - SOIL
B0BHZ6 - SOIL
B0BHZ7 - SOIL
B0BHZ8 - SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: CN ≤ 14 days
NO_2 / NO_3 ≤ 28 days
ANIONS (NO_2 NO_3 PO_4) are ≤ 48 hours from prep date to analysis date, no qualification required.

See attachment 5; form B-1.

026

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? (Yes) No N/A
Are initial calibration results acceptable? . . . . . (Yes) No N/A
Was a calibration check performed for all applicable analyses? (Yes) No N/A
Are calibration check results acceptable? . . . . . (Yes) No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A
Are laboratory blank results acceptable? . . . . . (Yes) No N/A
Were field/trip blanks analyzed? . . . . . Yes (No) N/A
Are field/trip blank results acceptable? . . . . . Yes No (N/A)
Comments:

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . (Yes)[1] No N/A
Are spike recoveries acceptable? . . . . . Yes (No)[2] N/A
Were LCS analyses performed at the required frequency? . . . . (Yes) No N/A
Are LCS recoveries acceptable? . . . . . (Yes) No N/A
Comments: (1) Analysis for NO_2/NO_3 as N by colorimetric does not require spike and matrix spike, no data given. (2) % REC for fluoride is unacceptable.

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . Yes (No)[1] N/A
Are laboratory duplicate sample RPD values acceptable? . . . . Yes No (N/A)
Are field duplicate RPD values acceptable? . . . . . (Yes)[2] No N/A
Are field split RPD values acceptable? . . . . . Yes No (N/A)[3]

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: (2) Sample BOBHZ8 is duplicate of sample BOBHZ7. (1) Duplicates were not performed for NO_2/NO_3 or anion analysis, however, no qualification required. (3) No field split data given.

7. ANALYTE QUANTITATION

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

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

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

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

Comments:

HOLDING TIME SUMMARY

SDG: WD004-ITC-02 VALIDATOR: WATERBURY DATE: 10/28/94 PAGE ___ OF ___

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBHZ5	NO_2/NO_3	3.7.94		3.29.94		22	none.
BOBHZ6	NO_2/NO_3	3.8.94		3.29.94		21	none.
BOBHZ7	NO_2/NO_3	3.16.94		3.29.94		13	none.
BOBHZ8	NO_2/NO_3	3.16.94		3.29.94		13	none.
BOBHZ5	CN DIST.	3.7.94		3.17.94		10	none.
BOBHZ6	CN DIST.	3.8.94		3.17.94		9	none.
BOBHZ7	CN DIST.	3.16.94		3.24.94		8	none.
BOBHZ8	CN DIST	3.16.94		3.24.94		8	none.
BOBHZ5	ANIONS	3.7.94	3.26.94	3.27.94	19	24 hr.	none.
BOBHZ6	ANIONS	3.8.94	3.26.94	3.26.94	18	<24 hr.	none.
BOBHZ7	ANIONS	3.16.94	3.29.94	3.29.94	13	<24 hr.	none.
BOBHZ8	ANIONS	3.16.94	3.29.94	3.29.94	13	<24 hr.	none.

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029

MATRIX SPIKE/MATRIX SPIKE DUPLICATE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0004
Contract Name:	Westinghouse Hanford	Job Number:	204
Client Sample ID:	~~4-03-219-01E~~ BOBH25 BG 5-20-94	Extraction Date:	N/A
Lab Sample ID:	AA3767 OS/MS/MSD	Analysis Date:	03/28/94
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Orig. Sample Result		Conc. Spike Added	Conc. MS	% Rec.	Conc. MSD	%Rec.	RPD
fluoride	0.43	+	2	2.9	124	3	129	4
chloride	1.8	+	3	4.1	77	4.1	77	0
nitrite	0.4	U	2.5	-	0	-	0	-
bromide	1	U	10	-	0	-	0	-
nitrate	0.4	U	2.5	-	0	-	0	-
phosphate	1	U	10	-	0	-	0	-
sulfate	12	+	15	30	120	30	120	0

RPD - Relative percent difference.
\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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RECORD COPY

MEMORANDUM

NOV 1994

TO: 200-UP-1 Project QA Record

November 28, 1994

FR: Diana Waterbury, Golder Associates Inc.

RE: INORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE W0004-ITC-022 (943-1610.031 022MET.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by International Technology Analytical Services. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BHZ5	SOIL	METALS	
B0BHZ6*	SOIL	METALS	
B0BHZ7	SOIL	METALS	
B0BHZ8	SOIL	METALS	DUPLICATE OF B0BHZ7
		SEE ATTACHMENT 4	
* Indicates the sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as incicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of matrix spike recoveries as described below.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 100 determinations reported, 96 of

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which were deemed valid. This results in a completeness of 96 percent which meets the normal work plan completeness objectives of 90 percent.

MAJOR DEFICIENCIES

The following major deficiency was identified during data validation which required qualification of data as unusable.

Preparation Blank

- The absolute value of the preparation blank for cyanide exceeded the CRDL. Attachments 2 and 5 provide a summary of samples affected, qualification applied and supporting documentation.

MINOR DEFICIENCIES

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

Matrix Spike Recovery

- The matrix spike recoveries for selenium and antimony were unacceptable. Attachments 2 and 5 provide a summary of samples affected, qualification applied and supporting documentation.

Analytical Spike Recovery

- The analytical spike recoveries for selenium were unacceptable. Attachments 2 and 5 provide a summary of samples affected, qualifications applied and supporting documentation.

FIELD QC

- Sample B0BHZ8 was identified as the field duplicate of sample B0BHZ7. All relative percent differences (%RPD) were within control limits. Qualification is not required based on field QC.

REFERENCES

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement or Work, Revision 1.0; September 7, 1994, Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected. Due to a minor quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the CRDL but greater then the IDL. Due to a minor quality control deficiency identified during data validation, The associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0004-ITC-022	REVIEWER: D. WATERBURY	DATE: 11-07-94	PAGE 1 OF 1
COMMENTS: INORGANICS			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
Cyanide	UR	B0BHZ5	PREPARATION BLANK.
Cyanide	UR	B0BHZ6	PREPARATION BLANK.
Cyanide	UR	B0BHZ7	PREPARATION BLANK.
Cyanide	UR	B0BHZ8	PREPARATION BLANK.
Selenium	UJ	B0BHZ5	MATRIX SPIKE RECOVERY
Selenium	UJ	B0BHZ6	MATRIX SPIKE RECOVERY
Selenium	UJ	B0BHZ7	MATRIX SPIKE RECOVERY
Selenium	UJ	B0BHZ8	MATRIX SPIKE RECOVERY
Selenium	UJ	B0BHZ6	ANALYTICAL SPIKE
Selenium	UJ	B0BHZ7	ANALYTICAL SPIKE
Antimony	UJ	B0BHZ5	MATRIX SPIKE RECOVERY
Antimony	UJ	B0BHZ6	MATRIX SPIKE RECOVERY
Antimony	UJ	B0BHZ7	MATRIX SPIKE RECOVERY
Antimony	UJ	B0BHZ8	MATRIX SPIKE RECOVERY

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	B0BHZ5		B0BHZ6		B0BHZ7		B0BHZ8	
	Date	3-7-94		3-8-94		3-16-94		3-16-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	14100.000		7160.000		4460.000		4370.000	
ANTIMONY	MG/KG	11.600	UJ	10.800	UJ	10.400	UJ	10.200	UJ
ARSENIC	MG/KG	7.200		2.200		0.570	B	0.480	B
BARIUM	MG/KG	96.000		117.000		39.000	B	43.600	
BERYLLIUM	MG/KG	0.910	B	0.440	B	0.340	B	0.340	B
CADMIUM	MG/KG	1.200	U	1.100	U	1.000	U	1.000	U
CALCIUM	MG/KG	14700.000		80500.000		2220.000		2200.000	
CHROMIUM	MG/KG	19.100		14.200		9.600		11.200	
COBALT	MG/KG	14.500		10.100	B	7.100	B	6.700	B
COPPER	MG/KG	22.300		11.000		9.700		9.500	
IRON	MG/KG	26800.000		18200.000		13100.000		13000.000	
LEAD	MG/KG	19.300		0.440	U	2.700		2.600	
MAGNESIUM	MG/KG	8750.000		5310.000		3080.000		3190.000	
MANGANESE	MG/KG	326.000		342.000		214.000		235.000	
MERCURY	MG/KG	0.110	U	0.100	U	0.080	U	0.100	U
NICKEL	MG/KG	17.200		13.000		9.800		12.300	
POTASSIUM	MG/KG	2510.000		795.000	B	699.000	B	678.000	B
SELENIUM	MG/KG	0.450	UJ	0.440	UJ	0.400	UJ	0.410	UJ
SILVER	MG/KG	1.300	B	2.000	B	1.000	U	1.000	U
SODIUM	MG/KG	165.000	B	164.000	B	123.000	B	115.000	B
THALLIUM	MG/KG	0.450	U	0.440	U	0.400	U	0.410	U
VANADIUM	MG/KG	36.600		56.200		29.800		28.800	
ZINC	MG/KG	55.800		28.200		37.500		22.300	
TITANIUM	MG/KG	783.000		1210.000		809.000		816.000	
CYANIDE	MG/KG	1.200	UR	1.100	UR	1.000	UR	1.000	UR

The decimal places shown do not reflect the precision reported by the laboratory

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBH25 ~~0321901~~ BJ 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004

Matrix (soil/water): SOIL Lab Sample ID: AA3765

Level (low/med): LOW Date Received: 03/12/93

% Solids: 86.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14100			P	
7440-36-0	Antimony	11.6	U	~~N~~	P	* UJ
7440-38-2	Arsenic	7.2			F	
7440-39-3	Barium	96.0			P	
7440-41-7	Beryllium	0.91	B		P	
7440-43-9	Cadmium	1.2	U		P	
7440-70-2	Calcium	14700			P	
7440-47-3	Chromium	19.1			P	
7440-48-4	Cobalt	14.5			P	
7440-50-8	Copper	22.3			P	
7439-89-6	Iron	26800			P	
7439-92-1	Lead	19.3		S	F	
7439-95-4	Magnesium	8750			P	
7439-96-5	Manganese	326			P	
7439-97-6	Mercury	0.11	U		CV	
7440-02-0	Nickel	17.2			P	
7440-09-7	Potassium	2510			P	
7782-49-2	Selenium	0.45	U	~~N~~	F	* UJ
7440-22-4	Silver	1.3	B		P	
7440-23-5	Sodium	165	B		P	
7440-28-0	Thallium	0.45	U		F	
7440-62-2	Vanadium	36.6			P	
7440-66-6	Zinc	55.8			P	
	Titanium	783			P	
5955-70-0	Cyanide				NR	

Color Before: TAN Clarity Before: N/A Texture: FINE

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBH25 ~~0321901~~ 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004

Matrix (soil/water): SOIL Lab Sample ID: AA3766

Level (low/med): LOW Date Received: 03/12/93

% Solids: 86.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.2	U		~~AS~~ UR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

CYANIDE_ONLY.

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ6
~~0321902~~
Bg 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA3771
Level (low/med): LOW Date Received: 03/12/93
% Solids: 91.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7160			P	
7440-36-0	Antimony	10.8	U	~~N~~	P	*UJ
7440-38-2	Arsenic	2.2			F	
7440-39-3	Barium	117			P	
7440-41-7	Beryllium	0.44	B		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	80500			P	
7440-47-3	Chromium	14.2			P	
7440-48-4	Cobalt	10.1	B		P	
7440-50-8	Copper	11.0			P	
7439-89-6	Iron	18200			P	
7439-92-1	Lead	0.44	U		F	
7439-95-4	Magnesium	5310			P	
7439-96-5	Manganese	342			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	13.0			P	
7440-09-7	Potassium	795	B		P	
7782-49-2	Selenium	0.44	U	~~N~~	F	*UJ
7440-22-4	Silver	2.0	B		P	
7440-23-5	Sodium	164	B		P	
7440-28-0	Thallium	0.44	U		F	
7440-62-2	Vanadium	56.2			P	
7440-66-6	Zinc	28.2			P	
	Titanium	1210			P	
5955-70-0	Cyanide				NR	

Color Before: TAN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ6
0321902
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA3772
Level (low/med): LOW Date Received: 03/12/93
% Solids: 91.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.1	U		AS

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Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CYANIDE ONLY.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ7
~~0337501~~
89 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4245
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4460			P
7440-36-0	Antimony	10.4	U	~~N~~	P *US
7440-38-2	Arsenic	0.57	B		F
7440-39-3	Barium	39.0	B		P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2220			P
7440-47-3	Chromium	9.6			P
7440-48-4	Cobalt	7.1	B		P
7440-50-8	Copper	9.7			P
7439-89-6	Iron	13100			P
7439-92-1	Lead	2.7			F
7439-95-4	Magnesium	3080			P
7439-96-5	Manganese	214			P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	9.8			P
7440-09-7	Potassium	699	B		P
7782-49-2	Selenium	0.40	U	~~WN~~	F *US
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	123	B		P
7440-28-0	Thallium	0.40	U		F
7440-62-2	Vanadium	29.8			P
7440-66-6	Zinc	37.5			P
	Titanium	809			P
5955-70-0	Cyanide				NR

Color Before: BROWN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

11-7-94

ILM02.1

4/12/94

9613474.1474

0000096 RSW

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBHZ7 ~~0337501~~ 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004

Matrix (soil/water): SOIL Lab Sample ID: AA4246

Level (low/med): LOW Date Received: 03/19/94

% Solids: 96.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.0	U	—	AS UR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

CYANIDE_ONLY.

FORM I - IN

RSW 11-7-94

ILM02.1 8 4/4/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BCBH38
~~0337504~~
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4253
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4370			P	
7440-36-0	Antimony	10.2	U	~~N~~	P	*US
7440-38-2	Arsenic	0.48	B		F	
7440-39-3	Barium	43.6			P	
7440-41-7	Beryllium	0.34	B		P	
7440-43-9	Cadmium	1.0	U		P	
7440-70-2	Calcium	2200			P	
7440-47-3	Chromium	11.2			P	
7440-48-4	Cobalt	6.7	B		P	
7440-50-8	Copper	9.5			P	
7439-89-6	Iron	13000			P	
7439-92-1	Lead	2.6			F	
7439-95-4	Magnesium	3190			P	
7439-96-5	Manganese	235			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	12.3			P	
7440-09-7	Potassium	678	B		P	
7782-49-2	Selenium	0.41	U	~~N~~	F	*US
7440-22-4	Silver	1.0	U		P	
7440-23-5	Sodium	115	B		P	
7440-28-0	Thallium	0.41	U		F	
7440-62-2	Vanadium	28.8			P	
7440-66-6	Zinc	22.3			P	
	Titanium	816			P	
5955-70-0	Cyanide				NR	

Color Before: BROWN Clarity Before: N/A Texture: FINE
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

11-7-94 OSH

ILM02.1

9/12/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOB4Z8
0337504
BG 5-20-94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0004 SAS No.: SDG No.: W0004
Matrix (soil/water): SOIL Lab Sample ID: AA4254
Level (low/med): LOW Date Received: 03/19/94
% Solids: 96.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.0	U	—	AS UR

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CYANIDE ONLY.

FORM I - IN

DSH 11-7-94

ILM02.1
4/12/94

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 22 , 1994

Job Number: 204 & 234

This is the Certificate of Analysis for the following samples:

SDG:	W0004
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	03/12/94 & 03/19/94
Number of Samples:	Seven (7)
Sample Type:	Soil - six (6), Water - one (1)

I. Introduction

On March 12 and March 19, 1994, six (6) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

III. Quality Control

The volatile analyses were performed March 14-15, March 23 and March 26, 1994 by purge and trap with a J & W DB-624 column on Hewlett-Packard 5970 and Finnigan INCOS 500 GC/MS/DS units. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

The semivolatile analyses were performed March 29-30 and April 5-6, 1994 by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS unit. Sample BOBHZ5 was analyzed as a matrix spike and a matrix spike duplicate set.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

III. Quality Control (Continued)

The samples were digested on April 1, 1994 for ICP and March 31, 1994 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on April 1, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from March 31 through April 2, 1994; the remaining metals were analyzed by ICP on April 2, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBHZ5. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for antimony by ICP analysis and selenium by GFAA analysis. A post digestion spike was performed for antimony as required by CLP protocol. As the lead and titanium concentrations were greater than four times (4X) the spike added, spiking criteria did not apply for these analytes. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses. MSAs were performed as required by CLP protocol.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

III. Quality Control (Continued)

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

On March 29, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C). Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

The samples were analyzed for anions from March 26 through April 2, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample BOBHZ5. All QC results were acceptable.

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Matrix	Test
AA3763	4-03-219-01A	BOBHZ5	SOIL	VOC
AA3764	4-03-219-01B	BOBHZ5	SOIL	SVOC
AA3765	4-03-219-01C	BOBHZ5	SOIL	METALS
AA3766	4-03-219-01D	BOBHZ5	SOIL	CN
AA3767	4-03-219-01E	BOBHZ5	SOIL	ANIONS
AA3768	4-03-219-01F	BOBHZ5	SOIL	NO3NO2
AA3769	4-03-219-02A	BOBHZ6	SOIL	VOC
AA3770	4-03-219-02B	BOBHZ6	SOIL	SVOC
AA3771	4-03-219-02C	BOBHZ6	SOIL	METALS
AA3772	4-03-219-02D	BOBHZ6	SOIL	CN
AA3773	4-03-219-02E	BOBHZ6	SOIL	ANIONS
AA3774	4-03-219-02F	BOBHZ6	SOIL	NO3NO2
AA4243	4-03-375-01A	BOBHZ7	SOIL	VOC
AA4244	4-03-375-01B	BOBHZ7	SOIL	SVOC
AA4245	4-03-375-01C	BOBHZ7	SOIL	METALS
AA4246	4-03-375-01D	BOBHZ7	SOIL	CN
AA4247	4-03-375-01E	BOBHZ7	SOIL	ANIONS
AA4248	4-03-375-01F	BOBHZ7	SOIL	NO3NO2
AA4249	4-03-375-02A	BOBJOO	SOIL	VOC
AA4250	4-03-375-03A	BOBHZ9	SOIL	VOC
AA4251	4-03-375-04A	BOBHZ8	SOIL	VOC
AA4252	4-03-375-04B	BOBHZ8	SOIL	SVOC
AA4253	4-03-375-04C	BOBHZ8	SOIL	METALS
AA4254	4-03-375-04D	BOBHZ8	SOIL	CN
AA4255	4-03-375-04E	BOBHZ8	SOIL	ANIONS
AA4256	4-03-375-04F	BOBHZ8	SOIL	NO3NO2
AA4257	4-03-375-05A	Trip Blank	WATER	VOC
AA4257	4-03-375-05B	Trip Blank	WATER	VOC

IT Corporation
April 22, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 204 & 234

IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree A Schneider

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

Sample No.	Matrix*	Date Sampled	Time Sampled															
BOBHZ5	S	3-7-94	1315	X	X	X	X	X	X	X	X							
40321901AF																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1340 3-10-94	Received By: Heidelberg	Date/Time: 3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

H0322001-Rad.

SDG W0004

LOWEST HOLDING TIME = 7DAYS

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample ; Yellow - Sampler

BC-6000-928 (12/92)

W0 #204

9615744.1484

024

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks: NONE OBSERVED	Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE	

SAMPLE ANALYSIS																	
Preservative			COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container			aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)			1	1	1	1	1	1	1	1					1		
Volume			120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
			VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Sample No.	Matrix*	Date Sampled	Time Sampled														
BOBH26	S	3-8-94	1405	X	X	X	X	X	X	X	X						
40321902A-F																	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 3-8-94 1526	Received By: R. J. Stuff	Date/Time: 3/8/94 1526
Relinquished By: R. J. Stuff	Date/Time: 3/9/94 0905	Received By: W. V. Setzer	Date/Time: 3/9/94 0906
Relinquished By: W. V. Setzer	Date/Time: 1540 3/10/94	Received By: Hendelhey	Date/Time: 3/10 1400
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40322002-Rad.

SDG-W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

WO# 204

9613474.1485

025

WO#234

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045 WJS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	cool 4	
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	aGs	
No. of Container(s)	1	1	1	1	1	1	1	1					1	1	
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml	
SAMPLE ANALYSIS 403375	VOA (CLP) A	SEMIVOA (CLP) B	ICP MTL GFAA METALS Hg (CLP) C	Cn (CLP) D	ANIONS IC-F,CL SO4,NO2 NO3,PO4 E	NO2,NO3 EPA(353.2) F	*1	*1					VOA TRIP (CLP)	VOA (Field)	

	Sample No.	Matrix*	Date Sampled	Time Sampled														
1	BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X						
2	BOBJ00	S	3-16-94	0915													X	
3	BOBHZ9	S	3-16-94	1340														X
4	BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	3-18-94 1200	R. Bayd [signature]	3/18/94 1210

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original Sample Yellow - Sampler

BC-6000-B2B (12/92)

9619474.1486

020

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: 200-UP-1			DATA PACKAGE: W0004-ITC-022		
VALIDATOR: Waterbury	LAB: IT			DATE: 10/25/94	
CASE:			SDG: W0004		

ANALYSES PERFORMED					
☒ CLP/ICP	☒ CLP/GFAA	☒ CLP/Hg	☒ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX
BOBHZ5 - SOIL
BOBHZ6 - SOIL
BOBHZ7 - SOIL
BOBHZ8 - SOIL

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: SEE ATTACHED SHEET B-1 FOR SUMMARY.

028

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No[1] N/A
Were field/trip blanks analyzed? . . . . . Yes[2] No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: (1) SAMPLES BOBHZ5, BOBHZ6, BOBHZ7, AND BOBHZ8 ARE REJECTED FOR CYANIDE DUE TO PREPARATION BLANK RESULTS. Ca, Fe, AND Zn WERE ALSO DETECTED BUT NO QUALIFICATIONS REQUIRED.
(2) SAMPLE BOBHZ8 IS FIELD DUPL. OF SAMPLE BOBHZ7

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No[1] N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: (1) SAMPLE BOBHZ5 WAS USED FOR SPIKE RECOVERIES. SE IS QUALIFIED UJ. Pb AND Ti ARE OUTSIDE %R RANGE BUT CONC. ARE >4X SPIKE ADDED THEREFORE NO QUALIFICATION REQUIRED. Sb IS QUALIFIED. SEE FORM I AND SPIKE RECOVERY SHEETS FOR SUMMARY AND CALC.

029

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

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

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

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

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

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

Comments: SAMPLE BOBH28 IS FIELD DUP OF SAMPLE BOBH27.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

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

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . ~~Yes~~ No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments: (1) The analytical spike recovery for selenium was unacceptable, effecting samples BOBH26 & BOBH27. See attachment 5. (Accuracy data summary.)

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

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

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

Comments:

HOLDING TIME SUMMARY

SDG: WD004-ITC-02 VALIDATOR: WATERBURY DATE: 10/28/94 PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBHZ5	Hg	3.7.94		4.1.94		24	none
* BOBHZ6	Hg	3.8.94		4.1.94		23	none
BOBHZ7	Hg	3.16.94		4.1.94		15	none
BOBHZ8	Hg	3.16.94		4.1.94		15	none
BOBHZ5	METALS	3.7.94		4.1.94		24	none
* BOBHZ6	METALS	3.8.94		4.1.94		23	none
BOBHZ7	METALS	3.16.94		4.1.94		15	none
BOBHZ8	METALS	3.16.94		4.1.94		15	none
BOBHZ5	CN	3.7.94		3.17.94		10	none
* BOBHZ6	CN	3.8.94		3.17.94		9	none
BOBHZ7	CN	3.16.94		3.25.94		9	none
BOBHZ8	CN	3.16.94		3.25.94		9	none

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U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: W0004 SAS No.: _____ SDG No.: W0004_

Preparation Blank Matrix (soil/water): SOIL_

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	PBS0401A PBS0325(CU) CPBS0401A Preparation Blank APBS0331A	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	8.000	U	P
Antimony	50.0	U	50.0	U	50.0	U	50.0	U	10.000	U	P
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Barium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Calcium	20.0	U	20.0	U	20.0	U	20.0	U	11.506	B	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Cobalt	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	4.496	B	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Magnesium	50.0	U	50.0	U	50.0	U	50.0	U	10.000	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Mercury	0.2	U	0.2	U	0.2	U			0.100	U	CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	4.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Silver	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Sodium	100.0	U	100.0	U	100.0	U	100.0	U	20.000	U	P
Thallium	2.0	U	-2.0	B	2.0	U	2.0	U	0.400	U	F
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	2.612	B	P
Titanium	3.0	U	3.0	U	-3.4	B	3.0	U	0.600	U	P
Cyanide	10.0	U	-16.0		10.0	U	10.0	U	-1.600		AS

FORM III - IN

HZ5
HZ6

HZ7
HZ8

DSN 11-7-94

ILM02.1
8
4/12/94

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~~0000109~~ DSSN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOEH258
~~03219018~~
BG 5-20-94

Lab Name: ITAS_KNOXVILLE_____ Contract:HANFORD___

Lab Code: ITSTU_ Case No.: W0004 SAS No.: _____ SDG No.: W0004_
Matrix: SOIL_____ Level (low/med): _LOW____
% Solids for Sample: _86.4

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	41.3449		11.5741	U	115.74	35.7	N	P
Arsenic	75-125	14.1544		7.1532		9.08	77.1		F
Barium	75-125	524.5671		96.0116		462.96	92.6		P
Beryllium	75-125	11.6620		0.9144	B	11.57	92.9		P
Cadmium	75-125	10.4491		1.1574	U	11.57	90.3		P
Calcium									NR
Chromium	75-125	63.4051		19.1250		46.30	95.6		P
Cobalt	75-125	120.3264		14.4583		115.74	91.5		P
Copper	75-125	75.7917		22.3472		57.87	92.4		P
Iron									NR
Lead		20.9695		19.2901		4.54	37.0		F
Magnesium									NR
Manganese	75-125	435.2454		325.9259		115.74	94.5		P
Mercury	75-125	0.5699		0.1102	U	0.55	103.6		CV
Nickel	75-125	122.8727		17.2500		115.74	91.3		P
Potassium									NR
Selenium	75-125	1.5841		0.4539	U	2.27	69.8	N	F
Silver	75-125	11.6759		1.2917	B	11.57	89.8		P
Sodium									NR
Thallium	75-125	9.7472		0.4539	U	11.35	85.9		F
Vanadium	75-125	146.2176		36.6412		115.74	94.7		P
Zinc	75-125	162.6667		55.7708		115.74	92.4		P
Titanium		999.9583		782.5926		115.74	187.8		P
Cyanide									NR

Comments:
Lead and Titanium concentrations are greater than 4x the spike added, spiking criteria are not applicable for these analytes.

FORM V (Part 1) - IN ILM02.1

DSSN 11-7-94 4/12/94

ACCURACY DATA SUMMARY - FORM B-4

SDG: W0004	REVIEWER: WATERBURY	DATE: 11.8.94	PAGE 1 OF 1
COMMENTS: 943-1610.031 Inorganics			

SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
BOBHZ6	Selenium	56.1	BOBHZ6	UJ
BOBHZ7	Selenium	77.9	BOBHZ7	UJ

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MEMORANDUM

JAN 1995

TO: 200-UP-1 Round 1 Soil Project QA Record January 3, 1995

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0004-ITC-022 (943-1610.031 022RAD.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0004-ITC-022 prepared by International Technology Laboratory. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	MEDIA	ANALYSIS
B0BHZ5		SOIL	RADIOCHEMISTRY
B0BHZ6*		SOIL	
B0BHZ7		SOIL	SEE ATTACHMENT 4
B0BHZ8	DUPLICATE OF B0BHZ7	SOIL	
* Indicates the sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the minor deficiencies identified below.

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

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

Revised 1-3-95 TC

Completeness. The data package was complete for all requested analyses with the exception of the minor deficiency identified below. A total of four samples were validated in this data package with a total of eighty (80) determinations reported and four (4) determinations not reported. All reported results were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blank

- Americium-241 was detected in the laboratory blank therefore, associated positive results have been qualified as estimated. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

Laboratory Control Sample

- The laboratory control sample recovery for neptunium-237 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

Results Verification

- Minimum detectable activities could not be verified by recalculation for neptunium-237, total strontium, and technetium-99 therefore associated nondetect results have been qualified as estimated. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

- Sample results could not be verified by recalculation for isotopic uranium-234/235/and 238 therefore associated detected results have been qualified as estimated. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

- Carbon-14 was not reported due to a deficiency of carbon in the samples as indicated in the laboratory case narrative.

FIELD QC

- Sample B0BHZ8 is identified as the field duplicate of sample B0BHZ7. All relative percent differences were acceptable.

Revised 1-3-95

REFERENCES

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994, Westinghouse Hanford Company, Richland, Washington.

Revised 1-3-95

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0004-ITC-022	REVIEWER: T. STAPP	DATE: 11-02-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
AMERICIUM-241	J	B0BHZ5, B0BHZ6, B0BHZ7, B0BHZ8	CONTAMINANT DETECTED IN LABORATORY BLANK
NEPTUNIUM-237	J	B0BHZ7	LABORATORY CONTROL SAMPLE RECOVERY >130%
NEPTUNIUM-237	UJ	B0BHZ5, B0BHZ6, B0BHZ8	RECALCULATED MDA'S DO NOT MATCH REPORTED MDA'S
TECHNETIUM-99, TOTAL STRONTIUM	UJ	B0BHZ5, B0BHZ6, B0BHZ7, B0BHZ8	RECALCULATED MDA'S DO NOT MATCH REPORTED MDA'S
URANIUM-234/235/238	J	B0BHZ6, B0BHZ7, B0BHZ8	RECALCULATED RESULTS DO NOT MATCH REPORTED RESULTS
URANIUM-234/238	J	B0BHZ5	RECALCULATED RESULTS DO NOT MATCH REPORTED RESULTS

Revised 1-3-95

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0004-ITC-022

	Samp#	B0BHZ5		B0BHZ6		B0BHZ7		B0BHZ8	
	Date	3-7-94		3-8-94		3-16-94		3-16-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	pCi/G	0.567	J	0.589	J	0.746	J	0.619	J
CURIUM-242	pCi/G	0.019		0.028	U	0.026	U	0.016	U
CURIUM-244	pCi/G	0.018	U	0.024	U	0.015	U	0.013	U
NEPTUNIUM-237	pCi/G	0.015	UJ	0.011	UJ	1.940	J	0.011	UJ
PLUTONIUM-238	pCi/G	0.037	U	0.021	U	0.031	U	0.021	U
PLUTONIUM-239/240	pCi/G	0.023	U	0.034	U	0.019	U	0.021	U
URANIUM-234	pCi/G	0.947	J	0.709	J	0.698	J	0.730	J
URANIUM-235	pCi/G	0.032	U	0.039	J	0.065	J	0.043	J
URANIUM-238	pCi/G	1.030	J	0.836	J	0.655	J	0.803	J
COBALT-58	pCi/G	0.025	U	0.021	U	0.016	U	0.017	U
COBALT-60	pCi/G	0.021	U	0.017	U	0.015	U	0.014	U
CESIUM-137	pCi/G	0.019	U	0.015	U	0.014		0.013	U
EUROPIUM-152	pCi/G	0.099	U	0.099		0.068	U	0.094	
EUROPIUM-154	pCi/G	0.065	U	0.050	U	0.045	U	0.044	U
EUROPIUM-155	pCi/G	0.078		0.075		0.041		0.034	U
IRON-59	pCi/G	0.070	U	0.053	U	0.048	U	0.047	U
GROSS ALPHA	pCi/G	11.600		6.420		9.150		5.290	
GROSS BETA	pCi/G	30.600		16.400		20.500		22.400	
TOTAL STRONTIUM	pCi/G	0.106	UJ	0.104	UJ	0.116	UJ	0.100	UJ
TECHNETIUM-99	pCi/G	0.010	UJ	0.010	UJ	0.010	UJ	0.010	UJ

The decimal places shown do not reflect the precision reported by the laboratory

Verified 1-3-95

Revised 1-3-95

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

Borehole: 299-W19-35

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND

SDG NO.: W0004

LAB SAMPLE ID: 4-03-220-01

MATRIX: SOIL

WHC ID: BOBHZ5

DATE RECEIVED: 3/10/94

INTERVAL: 158'-160.5'

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	Q	METHOD NUMBER
AM-241	5.67E-01	1.06E-01	1.38E-01	.0201 0.735	J	RD3302
CM-242	1.91E-02	2.20E-02	2.22E-02	.0182 0.735		RD3302
CM-244	~~3.97E-04~~	~~7.94E-04~~	~~7.96E-04~~	.0172 0.735	UJ	RD3302
NP-237	~~5.86E-03~~	~~1.28E-02~~	~~1.29E-02~~	.0153 0.653	UJ	RD3208
PU-238	~~1.71E-03~~	~~3.42E-03~~	~~3.43E-03~~	.0369 0.487	U	RD3209
PU239/40	~~0.00E+00~~	~~0.00E+00~~	~~2.56E-02~~	.0231 0.487	UJ	RD3209
U-234	9.47E-01	1.58E-01	2.05E-01	.0352 0.643	J	RD3234
U-235	~~2.12E-02~~	~~2.60E-02~~	~~2.63E-02~~	.0315 0.643	U	RD3234
U-238DA	1.03E+00	1.64E-01	2.17E-01	.0284 0.643	J	RD3234
CO-60	~~-3.23E-03~~	~~1.26E-02~~	~~1.26E-02~~	.02069 N/A	UJ	RD3219
FE-59	~~-8.41E-03~~	~~4.24E-02~~	~~4.24E-02~~	.07011 N/A	UJ	RD3219
EU-152	~~8.09E-02~~	~~5.41E-02~~	~~5.47E-02~~	.09926 N/A	UJ	RD3219
CO-58	~~1.30E-04~~	~~1.53E-02~~	~~1.53E-02~~	.02518 N/A	UJ	RD3219
CS-137DA	~~6.08E-03~~	~~1.18E-02~~	~~1.18E-02~~	.01929 N/A	UJ	RD3219
EU-155	7.77E-02	3.24E-02	3.33E-02	.0536 N/A	J	RD3219
EU-154	~~4.10E-02~~	~~4.08E-02~~	~~4.10E-02~~	.0646 N/A	UJ	RD3219
ALPHA	1.16E+01	3.53E+00	3.75E+00	2.91 1		RD3222
BETA	3.06E+01	2.76E+00	3.42E+00	1.96 1		RD3222
TOTAL-SR	~~-1.20E-02~~	~~4.32E-02~~	~~4.33E-02~~	0.106 0.786	UJ	RD3204
TC-99	~~-1.64E-01~~	~~2.50E-01~~	~~1.19E+00~~	0.01 0.892	UJ	ITAS-IT-RS-0001

Verified 11-2-94

Revised 1-3-95

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

BOREHOLE: 299-W19-35

LAB NAME: ITAS-RICHLAND

SDG NO.: W0004

LAB SAMPLE ID: 4-03-220-02

MATRIX: SOIL

WHC ID: BOBHZ6

DATE RECEIVED: 3/10/94

INTERVAL: 179'-181'

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	Q	METHOD NUMBER
AM-241	5.89E-01	1.18E-01	1.54E-01	.0219 0.609	J	RD3302
CM-242	~~6.11E-04~~	~~1.22E-03~~	~~1.23E-03~~	.0281 0.609	UJ	RD3302
CM-244	~~9.58E-04~~	~~1.35E-03~~	~~1.36E-03~~	.0244 0.609	UJ	RD3302
NP-237	~~0.00E+00~~	~~0.00E+00~~	~~0.00E+00~~	.0112 0.653	UJ	RD3208
PU-238	~~0.00E+00~~	~~0.00E+00~~	~~2.35E-02~~	.0212 0.532	U	RD3209
PU239/40	~~1.56E-03~~	~~3.13E-03~~	~~3.14E-03~~	.0338 0.532	UJ	RD3209
U-234	7.09E-01	1.43E-01	1.76E-01	.0329 0.586	J	RD3234
U-235	3.88E-02	3.48E-02	3.54E-02	.0311 0.586	J	RD3234
U-238DA	8.36E-01	1.55E-01	1.95E-01	.0289 0.586	J	RD3234
CO-60	~~4.51E-03~~	~~9.76E-03~~	~~9.77E-03~~	.0167 N/A	UJ	RD3219
FE-59	~~5.22E-02~~	~~3.37E-02~~	~~3.41E-02~~	.0530 N/A	UJ	RD3219
EU-152	9.88E-02	4.65E-02	4.75E-02	.0896 N/A	J	RD3219
CO-58	~~5.19E-03~~	~~1.23E-02~~	~~1.23E-02~~	.0208 N/A	UJ	RD3219
CS-137DA	~~3.04E-03~~	~~9.32E-03~~	~~9.32E-03~~	.0154 N/A	UJ	RD3219
EU-155	7.51E-02	2.69E-02	2.79E-02	.0462 N/A	J	RD3219
EU-154	~~1.22E-02~~	~~2.98E-02~~	~~2.98E-02~~	.0499 N/A	UJ	RD3219
ALPHA	6.42E+00	2.83E+00	2.91E+00	3.04 1		RD3222
BETA	1.64E+01	2.20E+00	2.45E+00	2.11 1		RD3222
TOTAL-SR	~~5.40E-02~~	~~5.10E-02~~	~~5.27E-02~~	0.104 0.838	UJ	RD3204
TC-99	~~-4.29E-02~~	~~2.56E-01~~	~~1.20E+00~~	0.01 0.892	UJ	ITAS-IT-RS-0001

Verified 11-2-94

Revised 1-3-95

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0004
LAB SAMPLE ID: 4-03-376-01
MATRIX: SOIL
WHC ID: BOBHZ7
INTERVAL: 236' – 238.5'
DATE RECEIVED: 3/18/94
REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	Q	METHOD NUMBER
AM-241	7.46E-01	1.30E-01	1.79E-01	.0209	0.637	J	RD3302
CM-242	~~-5.66E-04~~	~~1.13E-03~~	~~1.14E-03~~	.0260	0.637	UJ	RD3302
CM-244	~~0.00E+00~~	~~0.00E+00~~	~~1.72E-02~~	.0155	0.637	UJ	RD3302
NP-237	1.94E+00	2.22E-01	4.73E-01	.0169	0.653	J	RD3208
PU-238	~~-1.42E-03~~	~~2.84E-03~~	~~2.85E-03~~	.0307	0.586	U	RD3209
PU239/40	~~0.00E+00~~	~~0.00E+00~~	~~2.13E-02~~	.0192	0.586	UJ	RD3209
U-234	6.98E-01	1.33E-01	1.63E-01	.0312	0.674	J	RD3234
U-235	6.46E-02	4.08E-02	4.18E-02	.0251	0.674	J	RD3234
U-238DA	6.55E-01	1.28E-01	1.56E-01	.0269	0.674	J	RD3234
CO-60	~~9.86E-03~~	~~8.67E-03~~	~~8.73E-03~~	.0152	N/A	UJ	RD3219
FE-59	~~2.21E-02~~	~~2.83E-02~~	~~2.84E-02~~	.048	N/A	UJ	RD3219
EU-152	~~6.59E-02~~	~~3.73E-02~~	~~3.78E-02~~	.0678	N/A	UJ	RD3219
CO-58	~~-1.27E-02~~	~~1.06E-02~~	~~1.07E-02~~	.0163	N/A	UJ	RD3219
CS-137DA	1.42E-02	7.32E-03	7.45E-03	.0130	N/A	J	RD3219
EU-155	4.05E-02	2.31E-02	2.34E-02	.0367	N/A	J	RD3219
EU-154	~~1.02E-02~~	~~2.57E-02~~	~~2.57E-02~~	.0447	N/A	UJ	RD3219
ALPHA	9.15E+00	3.15E+00	3.30E+00	2.70	1		RD3222
BETA	2.05E+01	2.37E+00	2.73E+00	2.06	1		RD3222
TOTAL-SR	~~2.11E-02~~	~~5.22E-02~~	~~5.25E-02~~	0.116	0.79	UJ	RD3204
TC-99	~~-1.79E-01~~	~~2.50E-01~~	~~1.19E+00~~	0.01	0.892	UJ	ITAS-IT-RS-0001

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11-4-94

Verified 11-2-94

Revised 1-3-95

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682A-6-93

9613474.1507

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0004
LAB SAMPLE ID: 4-03-376-02
MATRIX: SOIL
WHC ID: BOBHZ8
DATE RECEIVED: 3/18/94
INTERVAL: 236 – 238.5
REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	Q	METHOD NUMBER
AM-241	6.19E-01	1.09E-01	1.45E-01	.0131	0.75	J	RD3302
CM-242	~~1.20E-02~~	~~1.70E-02~~	~~1.71E-02~~	.0162	0.75	UJ	RD3302
CM-244	~~0.00E+00~~	~~0.00E+00~~	~~1.46E-02~~	.0132	0.75	UJ	RD3302
NP-237	~~6.37E-03~~	~~1.27E-02~~	~~1.28E-02~~	.0113	0.653	UJ	RD3208
PU-238	~~0.00E+00~~	~~0.00E+00~~	~~2.34E-02~~	.0212	0.533	U	RD3209
PU239/40	~~0.00E+00~~	~~0.00E+00~~	~~2.34E-02~~	.0211	0.533	UJ	RD3209
U-234	7.30E-01	1.51E-01	1.85E-01	.0337	0.541	J	RD3234
U-235	4.28E-02	3.77E-02	3.83E-02	.0313	0.541	J	RD3234
U-238DA	8.03E-01	1.58E-01	1.96E-01	.0374	0.541	J	RD3234
CO-60	~~1.45E-03~~	~~8.26E-03~~	~~8.26E-03~~	.0140	N/A	UJ	RD3219
FE-59	~~2.01E-02~~	~~2.88E-02~~	~~2.89E-02~~	.0469	N/A	UJ	RD3219
EU-152	9.36E-02	3.37E-02	3.50E-02	.0657	N/A	J	RD3219
CO-58	~~2.23E-03~~	~~1.03E-02~~	~~1.03E-02~~	.0169	N/A	UJ	RD3219
CS-137DA	~~2.40E-03~~	~~7.57E-03~~	~~7.57E-03~~	.0128	N/A	UJ	RD3219
EU-155	~~2.96E-02~~	~~2.18E-02~~	~~2.20E-02~~	.0345	N/A	UJ	RD3219
EU-154	~~1.05E-02~~	~~2.72E-02~~	~~2.72E-02~~	.0440	N/A	UJ	RD3219
ALPHA	5.29E+00	2.64E+00	2.70E+00	3.04	1		RD3222
BETA	2.24E+01	2.43E+00	2.85E+00	1.97	1		RD3222
TOTAL-SR	~~2.87E-02~~	~~4.61E-02~~	~~4.66E-02~~	.0996	0.824	UJ	RD3204
TC-99	~~5.48E-01~~	~~2.43E-01~~	~~1.16E+00~~	0.01	0.892	UJ	ITAS-IT-RS-0001

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1-4-94

Verified 11-2-94

Revised 1-3-95

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9613474.1509

INTERNATIONAL TECHNOLOGY CORPORATION

MAY 1994 RECEIVED SDLA

CERTIFICATE OF ANALYSIS

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

May 10, 1994

Attention: J.A.Lerch

RECORD COPY

SAF Number	:	94-046
Date Received by Lab	:	March 18, 1994
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0004
Data Deliverable:	:	Stand-Alone

I. Introduction

On March 10 and 18, 1994, four soil samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the WHC specific IDs:

ITAS-Richland ID	WHC ID	Matrix	Date of Receipt
403220-01A	B0BHZ5	Soil	3/10/94
403220-02A	B0BHZ6	Soil	3/10/94
403376-01A	B0BHZ7	Soil	3/18/94
403376-02A	B0BHZ8	Soil	3/18/94

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

014

Regional Office
2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

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11-4-94

0005

The requested analyses were:

Alpha Spectroscopy
Americium-241, Curium-244 by method ITAS-RD-3302
Neptunium-237 by method ITAS-RD-3208
Plutonium-238, 239/40 by method ITAS-RD-3209
Uranium-234, 235, 238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Carbon-14 by method ITAS-RD-3247
Technetium-99 by method ITAS-IT-RS-0001

III. Quality Control

The analytical results for each analysis performed under SDG W0002 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate.

Quality control sample results are reported in the same units as sample results except for gross alpha and gross beta quality control sample results which are reported in pCi/sample.

IV. Comments

The initial radioactivity screening of the samples classified them as Category I with the exception of sample B0BHZ5 which was classified as Category II.

The soil samples were received at ITAS-Richland with references to SAF 94-045 on the chain of custody (COC) documentation and sample labels. The referenced SAF number was changed to 94-046 as directed by WHC Record of Disposition No. ROD-94-0069.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The batch was reanalyzed due to failed QC samples on the first analytical processing. The second analysis of the batch was rejected due to low tracer recoveries in the samples. On the third analysis the tracer recoveries were within limits and the LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Neptunium-237 by method ITAS-RD-3208
The batch was reanalyzed due to a failed tracer yield on the matrix spike. The reanalysis data were accepted. The reanalysis batch LCS was biased high (160.9%) after yield correction using the matrix spike yield value of 65.3%. The high bias is attributed to the difference in the matrices of the matrix spike and the LCS. The LCS spike recovery was 105% without yield correction. The batch blank result was acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Plutonium-238, 239/40 by method ITAS-RD-3209
The LCS and the batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Uranium-234, 235, 238 by method ITAS-RD-3234

The LCS and the batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The samples were recounted for an extended counting time (700 min.) in order to meet the detection limit for one or more isotopes. The recount results did not meet the detection limits and the samples were counted a third time for 1000 min. The recount data were accepted. The recounts met the contractual detection limits for each requested isotope with the exception of Fe-59. The LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Gross Beta by method ITAS-RD-3222
The LCS and batch blank results were acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Strontium-90 by method ITAS-RD-3204
The LCS recovery was biased high (162%). The high result is attributed to strontium-85 in the spike. Concurrently analyzed spikes without strontium-85 added were acceptable. Strontium-85 will not be used in future spikes for this analysis on WHC samples. The batch blank result was acceptable. The sample and sample duplicate results were within the 3 sigma control limit.

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3247
The carbon-14 results were not reportable due to insufficient carbon in the samples to perform the analysis. The carbon-14 method requires that 2 grams of carbon be present in each sample. The samples were silicate in nature with zero measurable carbon dioxide produced during sample preparation.

Technetium-99 by method ITAS-IT-RS-0001
The laboratory control sample and batch blank results were acceptable. Two matrix spike samples were analyzed and produced acceptable results. The average chemical yield was used for batch yield corrections. The sample and sample duplicate results were within the 3 sigma control limit.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

11-4-94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~045 CSS~~ 045 WJS 3-18-94
Ice Chest No.	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4	COOL 4	
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs	aGs	
No. of Container(s)	1	1	1	1	1	1	1	1					1	1	
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml	40ml	
SAMPLE ANALYSIS 403375	VOA (CLP) A	SEMIVOA (CLP) B	ICP MTL GFAA METALS Hg (CLP) C	Cn (CLP) D	ANIONS IC-F,CL SO4,NO2 NO3,PO4 E	NO2,NO3 EPA(353.2) F	*1	*1					VOA TRIP (CLP)	VOA (Field)	

	Sample No.	Matrix*	Date Sampled	Time Sampled													
01	BOBHZ7	S	3-16-94	1300	X	X	X	X	X	X	X	X					
02	BOBJ00	S	3-16-94	0915										X			
03	BOBHZ9	S	3-16-94	1340											X		
04	BOBHZ8	S	3-16-94	1300	X	X	X	X	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature]	Date/Time: 3-18-94 1200	Received By: R. Bayd	Date/Time: 3/18/94 1210
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

40337601 (BOBHZ7) 40337602 (BOBHZ8)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9414924.1514

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: JML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container				aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)				1	1	1	1	1	1	1	1					1		
Volume				120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS																		
BOBHZ6	S	3-8-94	1405	X	X	X	X	X	X	X	X							
40321902AF																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 1526 3-8-94	Received By: R. P. Stull	Date/Time: 3/8/94 1526
Relinquished By: R. P. Stull	Date/Time: 3/9/94 0905	Received By: W. V. Setzer	Date/Time: 3/9/94 0906
Relinquished By: W. V. Setzer	Date/Time: 1540 3/10/94	Received By: [illegible]	Date/Time: 3/10/94
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

11032202Z-Rad. SDG W0004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9413120

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045
Ice Chest No.: SML-448	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0369 #14	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: NONE OBSERVED.		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE.

Sample No.	Matrix*	Date Sampled	Time Sampled															
B0BHZ5	S	3-7-94	1315	X	X	X	X	X	X	X	X							
40321901AF																		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	1340 3-10-94	Heidelberg	3/10 1450
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

110322001 - Rad.

SDL 100004

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9413134.1616

02

9613474.1517

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9613474.1518

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1 ROUND 1 SOIL		DATA PACKAGE: W0004-ITC-022
VALIDATOR: T. Stapp	LAB: IT Corp.	DATE: 10-31-94
CASE:	SDG:	

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX

BOBHZ5, BOBHZ6, BOBHZ7, BOBHZ8 / SOIL

1. Completeness . . . . . ☐ N/A

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

Comments:

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . NOTE (1) . . . . . 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: (1) Calibration for all detectors used, with the exception of Tc-99 LSC#3, has not been performed within one year of sample analysis, however continuing calib. data is acceptable and ∴ no qualification is required.

023

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

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

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . NOTE ① . . . . . Yes (No) N/A
Analytes detected in method blank? . NOTE ② . . . . . (Yes) No N/A
Field blank(s) analyzed? . . . . . Yes No (N/A)
Field blank results acceptable? . . . . . Yes No (N/A)
Analytes detected in field blank(s)? . . . . . Yes No (N/A)
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① Blank analyzed for Gamma analysis was done on a different date and for a different duration than analysis of Samples, however this is not a gross deficiency and no qualif. will be applied. ② See blank Summary page for Contaminants associated with Am-241 analysis. 1-3-95

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . (Yes) No N/A
Spike recoveries acceptable? . . . . . (Yes) No N/A
Spike source traceable? . . . . . (Yes) No N/A
Spike source expired? . . . . . Yes (No) N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments:

Revised 1-3-95

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

LCS analyzed? . NOTE ① . . . . . (Yes) No N/A
LCS recoveries acceptable? . . . NOTE ② . . . . . Yes (No) N/A
LCS traceable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? No . . . . . Yes (No) N/A

Comments: ① Gamma US analyzed on different data and duration from that of samples. Qualification applied see blank section.
② See LCS summary pages 1+2. 11-2-94
11-2-94

7. Chemical Recovery . . . . . ☐ N/A

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

Comments:

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . (Yes) No N/A
RPD Values Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments:

025

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . Note ① . . . . . (Yes) No N/A
Field duplicate RPD values acceptable? . . . . . (Yes) No N/A
Field split sample(s) analyzed? . . . . . Yes No (N/A)
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes No (N/A)
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments: ① Sample BOBHZ8 is identified as the field duplicate of sample BOBHZ7.

10. Holding Times

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

Comments:

	Collected	Grs α/β	Am^{241} Cm^{242}	Np237	$Pu^{238/239}$	Isotopic Gamma	Total Sr	Tc99
BOBHZ5	3-7-94	3-31-94	5-6-94	4-30-94	4-20-94	4-13	4-14	4-27	4-29-94
Z6	3-8-94					4-14	4-15		
Z7	3-16-94						4-22		
Z8	3-16-94						4-22		

DAYS: ≤180

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

Results reported for all required sample analyses? NOTE ① . . Yes (No) N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . NOTE ② . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . Note ③ . . . (Yes) No N/A
MDA's meet required detection limits? . . . . . (Yes) No N/A
Transcription/calculation errors? . . . . Note ④ . . . . (Yes) No N/A

Comments: ① Carbon-14 not analyzed and has been explained in the lab narrative. Qualification is not required.
② Raw data indicates that total Strontium was analyzed and not Sr-90 as was requested on the chain of custody. The lab narrative indicates Sr-90 method was used but this is not the case and all other references to Strontium analysis will be specified as total Strontium to be consistent with the raw data.
③ Recalculated results do not match reported results for U-234/235/238 and associated detected results will be qualified as estimated (J).
1-28-94 ④ Recalculated MDA's do not match reported ~~results~~ MDA's for Np-237, total Sr, and Tc-99 and associated non-detect results will be qualified as estimated (UJ).

Revised 11-28-94

026

9613474.1522

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

BLANK RESULTS
SUMMARY

LAB NAME: ITAS-RICHLAND SDG NO.: W0004

LAB SAMPLE ID: L-03-220-2B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
NP-237	0.00E+00	0.00E+00	0.00E+00	0.653	RD3208

LAB SAMPLE ID: L-03-220-3B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA YIELD	METHOD NUMBER
AM-241	5.97E-01	1.05E-01	1.39E-01	.0189 0.784	RD3302
CM-242	-7.43E-04	1.05E-03	1.06E-03	0.784	RD3302
CM-244	-7.41E-04	1.05E-03	1.05E-03	0.784	RD3302

LAB SAMPLE ID: L-03-220-1X

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA YIELD	METHOD NUMBER
TC-99	1.26E-02	2.57E-01	1.21E+00	0.010 0.892	ITAS-IT-RS-0001

No results >MDA for Tc-99

Associated positive results for Am-241 are qualified as estimated (J) since contamination was detected in the lab blank analyzed with the samples.

1-3-95

~~0016~~

This page added 1-3-95

82A-6-93

9613474.1523

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

page 1 of 21

LABORATORY CONTROL SAMPLES
SUMMARY

11-2-94

LAB NAME: ITAS-RICHLAND SDG NO.: W0004

LAB SAMPLE ID: L-03-220-2S

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	EXPECTED	% RECOVERY
NP-237	9.09E+00	4.82E-01	2.02E+00	0.653	5.65E+00	161

LAB SAMPLE ID: L-03-220-3S

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	EXPECTED	% RECOVERY
AM-241	5.26E+00	2.97E-01	8.26E-01	0.867	4.52E+00	116

The circled recovery of the indicated analyte is >130% limit and qualifies associated results above the MDA as estimated (J).

11-2-94

027 ~~0018~~

682A-6-93

W0004-ITC-022

Americium/Curium	
HEIS No.:	BOBHZ6
Lab ID:	40322002
Aliquot:	2.00E+00
Am241 net cpm:	0.4946
Am241 bkg cpm:	0.0004
Spl count time:	200
Bkg count time:	2500
Eff d/c:	3.225
Decay:	1
Yield:	0.609
Am241 calc:	5.89E-01
Am241 rptd:	5.89E-01
Am241 MDA calc:	2.19E-02
Am241 MDA rptd:	2.19E-02
Cm244 net cpm:	-0.0008
Cm244 bkg cpm:	0.0008
Cm244 decay:	1.006
Cm244 calc:	-9.58E-04
Cm244 rptd:	-9.58E-04
Cm244 MDA calc:	2.44E-02
Cm244 MDA rptd:	2.44E-02
Cm242 net cpm:	-0.0004
Cm242 bkg cpm:	0.0004
Cm242 decay:	1.285
Cm242 calc.:	-6.12E-04
Cm242 rptd:	-6.11E-04
Cm242 MDA calc:	2.81E-02
Cm242 MDA rptd:	2.81E-02

Neptunium	
HEIS No.:	BOBHZ6
Lab ID:	40322002
Aliquot:	2.00E+00
Np237 net cpm:	0
Np237 bkg cpm:	0
Spl count time:	200
Bkg count time:	2500
Eff d/c:	3.7
Decay:	1
Yield:	0.653
Np237 calc:	0.00E+00
Np237 rptd:	0.00E+00
Np237 MDA calc:	1.72E-02
Np237 MDA rptd:	1.13E-02

WOOD4-ITC-022

Plutonium	
HEIS No.:	B0BHZ6
Lab ID:	40322002
Aliquot:	2.00E+00
Pu238 net cpm:	0
Pu238 bkg cpm:	0
Spl count time:	200
Bkg count time:	1000
Pu238 Eff d/c:	3.703
Decay:	1.001
Yield:	0.532
Pu238 calc:	0.00E+00
Pu238 rptd:	0.00E+00
Pu238 MDA calc:	2.12E-02
Pu238 MDA rptd:	2.12E-02
Pu239 net cpm:	-0.001
Pu239 bkg cpm:	0.001
Pu239 d/c:	3.7
Pu239 decay:	1
Pu239 calc:	-1.56E-03
Pu239 rptd:	-1.56E-03
Pu239 MDA calc:	3.38E-02
Pu239 MDA rptd:	3.38E-02

Uranium	
HEIS No.:	B0BHZ6
Lab ID:	40322002
Aliquot:	2.00E+00
U-234 net cpm:	0.5084
U-234 bkg cpm:	0.0016
Spl count time:	200
Bkg count time:	2500
Eff d/c:	3.7
Decay:	1
Yield:	0.586
U-234 calc:	7.22E-01
U-234 rptd:	7.09E-01
U-234 MDA calc:	3.30E-02
U-234 MDA rptd:	3.29E-02
U-235 net cpm:	0.0288
U-235 bkg cpm:	0.0012
U-235 decay:	1
U-235 calc:	4.09E-02
U-235 rptd:	3.88E-02
U-235 MDA calc:	3.11E-02
U-235 MDA rptd:	3.11E-02
U-238 net cpm:	0.5942
U-238 bkg cpm:	0.0008
U-238 decay:	1
U-238 calc.:	8.43E-01
U-238 rptd:	8.36E-01
U-238 MDA calc:	2.89E-02
U-238 MDA rptd:	2.89E-02

W0004-ITC-022

Gross Alpha	
HEIS No.:	B0BHZ6
Lab ID:	40322002
Aliquot:	5.03E-02
Net counts:	0.142
Bkg counts:	0.038
Spl count time:	200
Bkg count time:	500
d/c:	5.048
Calc.:	6.42E+00
Rptd:	6.42E+00
MDA calc:	3.05E+00
MDA rptd:	3.04E+00

Gross Beta	
HEIS No.:	B0BHZ6
Lab ID:	40322002
Aliquot:	2.50E-01
Net counts:	3.138
Bkg counts:	1.092
Spl count time:	100
Bkg count time:	500
d/c:	2.898
Calc.:	1.64E+01
Rptd:	1.64E+01
MDA calc:	2.11E+00
MDA rptd:	2.11E+00

W0004-ITC-022

Total Strontium	
HEIS No.:	B0BHZ6
Sample:	40322002
Sep date:	4/26/94
Sep time:	15:30
Count date:	4/27/94
Count time:	18:53
Hours:	27.383333
Sample amt:	6.09E+00
Net, cpm:	0.356
Count time:	50
Bkg, cpm:	0.964
Count time:	.500
D/C 1:	2.205
D/C 2:	1.845
D/C 3:	1.991
Yield:	0.838
Calc:	5.40E-02
Rptd:	5.40E-02
MDA, Calc:	1.92E-01
MDA, rptd:	1.04E-01

Technetium-99	
HEIS No.:	B0BHZ6
Sample:	40322002
Bkg cpm:	28.44
Spl, amt:	2.00E+00
Spl cpm:	26.54
Count time:	125
Spl dpm:	29.21
d/c:	1.101
Yield:	0.892
Blk, dpm:	3.29E+01
Blk, d/c:	1.053
Calc:	-4.29E-02
Rptd:	-4.29E-02
MDA, calc:	5.95E-01
MDA, rptd:	1.00E-02

Revised 11-28-94

12/29/94

BHI-00101 Rev. 0

Data Validation Check List

for Project 200-UP-1

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0BHZ5		W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/10/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ6		W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/10/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ7		W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/18/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ8	dup	W0004	022	ITC	Y 5/24/94	Y 5/24/94	N	Y 5/24/94	Y 5/24/94	03/18/94 - SAF-94-046	Y 5/10/94	5/24/94
B0BHZ9	field blank	W0004	022	ITC	Y 5/24/94	N	N	N	N	03/18/94 - SAF-94-046	N	5/24/94
B0BJ00	Trip	W0004	022	ITC	Y 5/24/94	N	N	N	N	03/18/94 - SAF-94-046	N	5/24/94
B0BJ01		W0010	021	ITC	Y 6/02/94	Y 6/02/94	N	Y 6/02/94	Y 6/02/94	03/22/94 - SAF-94-046	Y 5/17/94	6/02/94
B0BJ02	Equip	W0010	021	ITC	Y 6/02/94	Y 6/02/94	N	Y 6/02/94	Y 6/02/94	03/22/94 - SAF-94-046	Y 5/17/94	6/02/94
B0BJ04	Trip	W0010	021	ITC	Y 6/02/94	N	N	N	N	03/22/94 - SAF-94-046	N	6/02/94
B0BJ05		W0034	055	ITC	Y 6/16/94	Y 6/16/94	N	Y 6/16/94	Y 6/16/94	04/18/94 - SAF-94-046	Y 6/17/94	6/17/94
B0BJ06	Trip	W0034	055	ITC	Y 6/16/94	N	N	N	N	04/18/94 - SAF-94-046	N	6/16/94

Validation Rcvd _____

9413171.1528

12/29/94

Data Validation Check List

for Project 200-UP-1

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0BJ07	Equip	W0034	055	ITC	Y 6/16/94	Y 6/16/94	N	Y 6/16/94	Y 6/16/94	04/18/94 - SAF-94-046	Y 6/17/94	6/17/94
B0BJ08	Dup	W0034	055	ITC	Y 6/16/94	Y 6/16/94	N	Y 6/16/94	Y 6/16/94	04/18/94 - SAF-94-046	Y 6/17/94	6/17/94
B0BJ09	Field	W0034	055	ITC	Y 6/16/94	N	N	N	N	04/18/94 - SAF-94-046	N	6/16/94
B0BJ10		W0034	055	ITC	Y 6/16/94	Y 6/16/94	N	Y 6/16/94	Y 6/16/94	04/21/94 - SAF-94-046	Y 6/17/94	6/17/94
B0BJ11		W0034	055	ITC	Y 6/16/94	Y 6/16/94	N	Y 6/16/94	Y 6/16/94	04/29/94 - SAF-94-046	Y 6/17/94	6/17/94
B0BJ12	Trip	W0034	055	ITC	Y 6/16/94	N	N	N	N	04/29/94 - SAF-94-046	N	6/16/94
B0BJ13		W0063	071	ITC	Y 7/11/94	Y 7/11/94	N	Y 7/11/94	Y 7/11/94	05/12/94 - SAF-94-046	Y 7/11/94	7/11/94
B0BJ14	Trip Blank	W0063	071	ITC	Y 7/11/94	N	N	N	N	05/12/94 - SAF-94-046	N	7/11/94
B0BJ15		W0063	071	ITC	Y 7/11/94	Y 7/11/94	N	Y 7/11/94	Y 7/11/94	05/20/94 - SAF-94-046	Y 7/11/94	7/11/94
B0BJ16		W0083	094	ITC	Y 8/01/94	Y 8/01/94	N	Y 8/01/94	Y 8/01/94	06/03/94 - SAF-94-046	Y 8/01/94	8/01/94

Validation Rcvd _____

9511.1473.01

12/29/94

Data Validation Check List

for Project 200-UP-1

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0BX93		W0083	094	ITC	X	X	N	X	X	06/03/94 - SAF-94-046	X	
B0BX94	Equip	W0083	094	ITC	Y 8/01/94	Y 8/01/94	N	Y 8/01/94	Y 8/01/94	06/03/94 - SAF-94-046	Y 8/01/94	8/01/94
B0BX95		W0083	094	ITC	X	X	N	X	X	06/03/94 - SAF-94-046	X	
B0BX96	Trip	W0083	094	ITC	Y 8/01/94	N	N	N	N	06/03/94 - SAF-94-046	N	8/01/94
B0BX97		W0083	094	ITC	Y 8/01/94	Y 8/01/94	N	Y 8/01/94	Y 8/01/94	06/13/94 - SAF-94-046	Y 8/01/94	8/01/94
B0BX98	Dup	W0083	094	ITC	Y 8/01/94	Y 8/01/94	N	Y 8/01/94	Y 8/01/94	06/13/94 - SAF-94-046	Y 8/01/94	8/01/94
B0BX99	Trip	W0083	094	ITC	Y 8/01/94	N	N	N	N	06/13/94 - SAF-94-046	N	8/01/94
B0BXB0	Field	W0083	094	ITC	Y 8/01/94	N	N	N	N	06/13/94 - SAF-94-046	N	8/01/94
B0BXB1		W0118	124	QUANTERRA	Y 8/19/94	Y 8/19/94	N	Y 8/19/94	Y 8/19/94	07/01/94 - SAF-94-046	Y 8/29/94	8/29/94
B0BXB4		W0161		QUANTERRA	Y 9/27/94	Y 9/27/94	N	Y 9/27/94	Y 9/27/94	08/03/94 - SAF-94-046	Y 10/04/94	10/04/94
B0BXB5		W0161		QUANTERRA	X	N	N	N	N	08/03/94 - SAF-94-046	N	

Validation Rcvd _____

DEC 1 4 1994

12/29/94

Data Validation Check List

for Project 200-UP-1

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0BXB6		W0161		QUANTERRA	Y 9/27/94	Y 9/27/94	N	Y 9/27/94	Y 9/27/94	08/08/94 - SAF-94-046	Y 10/04/94	10/04/94
B0BXB7	Trip	W0161		QUANTERRA	Y 9/27/94	N	N	N	N	08/08/94 - SAF-94-046	N	9/27/94
B0BXB7A		W0161		QUANTERRA	Y 9/27/94	Y 9/27/94	N	Y 9/27/94	Y 9/27/94	08/15/94 - SAF-94-046 - REPORTED AS B0BXB8	Y 10/04/94	10/04/94
B0BXB8	Trip ~~B~~B	W0161		QUANTERRA	Y 9/27/94	N	N	N	N	08/15/94 - SAF-94-046 - REPORTED AS B0BXB9	N	9/27/94
B0BXC0		W0183		QUANTERRA	Y 10/10/94	Y 10/10/94	N	N	Y 10/10/94	08/25/94 - SAF-94-046.	Y 10/21/94	10/21/94
B0BXC1	Trip	W0183		QUANTERRA	Y 10/10/94	N	N	N	N	08/25/94 - SAF-94-046	N	10/10/94

Data Entry Complete: DP 12-29-94 DEG

DATATRAC _____

Summary Rept

Validation Rcvd 12-27-94

1531 14 13 96

9613474.1532

DON'T SAY IT - - WRITE IT!

Date: 1-5-95 PKR

From: P. K. Reich H4-14, (509) 372-2785

Subject: Correction of Validation Date Received Stamp

The date stamped on this validation report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front pages(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Sample Management

9613474.1533

Golder Associates Inc.

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

Golder Associates

original data Valpkt
data received
1-5-95 PKR

DEC 1994
RECEIVED
Validation
Log In

December 23, 1994

Our ref: 943-1610.046.0400
94-1610/0/124

CH2M Hill
P.O. Box 1510
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION FINAL SUMMARY REPORT, ENVIRONMENTAL AND WASTE CHARACTERIZATION ANALYTICAL DATA VALIDATION, CONTRACT NO. MSH-SWV-315905

Dear Ms. Duncan:

Enclosed are two copies of the draft data validation final summary report for the 200-UP-1 Round 1 Soil Sampling Task.

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

Kent M. Angelos
Project Manager

Enclosures

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9613474.1534

BHI-00101
Rev. 00

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DEC 1994
RECEIVED
Validation
Log In

DATA VALIDATION SUMMARY REPORT
200-UP-1 ROUND 1 SOIL SAMPLING TASK

Prepared for

Bechtel Hanford Inc.
Richland, Washington

Prepared by

Golder Associates Inc.
Redmond, Washington

December 22, 1994

943-1610.046
1219SSS1.rpt

9613474.1535

BHI-00101
Rev. 00

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DATA VALIDATION SUMMARY REPORT
200-UP-1 ROUND 1 SOIL SAMPLING TASK

Prepared for

Bechtel Hanford Inc.
Richland, Washington

Prepared by

Golder Associates Inc.
Redmond, Washington

December 30, 1994

943-1610.046
1230SSS1.rpt

CONTENTS

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1.0 INTRODUCTION

This report presents a summary of data validation results on soil samples collected for the 200-UP-1 Round 1 Soil Sampling task.

The analyses performed for this project consisted of:

- Volatile Organic Compounds;
- Semivolatile Organic Compounds;
- Metals;
- General Chemistry Parameters; and
- Radiochemistry

The laboratory conducting the analyses was Quanterra Environmental Services, formerly International Technology Corporation.

As required by the contract and the WHC statement of work (WHC 1994), data validation was conducted using the Westinghouse data validation procedures for chemical and radiochemical analyses (WHC 1993a and 1993b), in which the sample results were validated to level D as described in the data validation procedures. At the completion of validation and verification of each data package, a data validation summary was prepared and transmitted with the original documentation to Hanford Analytical Services (HAS) for inclusion in the project QA record. Table 1-1 provides information concerning the data packages which were validated and verified. Tables 1-2, 1-3 and 1-4 provide a summary and explanation of all qualifiers applied as a result of organic, inorganic and radiochemical validation, respectively.

Seven sections, including this introduction, comprise this report. Sections 2.0 through 6.0 provide summaries of the validation by analytical fraction. Section 6.0 provides a list of references used to prepare this report and Appendixes A through J to this report include validated data summary tables.

1.1 CHEMICAL ANALYSES

Chemical analysis data consisted of:

- 38 soil samples analyzed for target compound list (TCL) volatile organics;
- 22 soil samples analyzed for TCL semivolatile organics;
- 22 soil samples analyzed for target analyte list (TAL) metals and cyanide; and
- 21 soil samples analyzed for general chemical parameters (anions: bromide, fluoride, chloride, sulfate, nitrate, nitrite, phosphate and nitrate+nitrite).

The chemical data and associated QC has been reviewed and validated to verify that reported sample results are acceptable for decision making purposes.

1.2 RADIOCHEMICAL ANALYSES

The radiochemical data consisted of:

- 22 soil samples analyzed for gross alpha, gross beta, americium-241, curium-242/244, neptunium-237, plutonium-238 and plutonium-239/240, uranium-234/235/238, strontium-90, iodine-129, technetium-99, cobalt-58/60, cesium-137, europium-152/154/155, and iron-59.

The radiochemical data and associated QC has been reviewed and validated to verify that reported sample results are acceptable for decision making purposes.

1.3 WESTINGHOUSE HANFORD GUIDANCE USED

Data validation was conducted using Westinghouse data validation procedures (WHC 1993a and 1993b).

1.4 DEFICIENCIES

There were major deficiencies identified during the validation of the volatile organic, metal, and general chemistry analyses resulting in qualification of sample results as unusable (R, UR).

There were several minor deficiencies identified during validation in which sample results were qualified as estimated (J, BJ, UJ). This report summarizes all the minor deficiencies identified during validation and the qualification applied.

1.6 SAMPLES AND ANALYSES VALIDATED

Table 1-1 provides a cross-reference list of all samples validated including data package tracking numbers, HEIS sample numbers, sample dates, site and sample locations, sample type, and analyses performed.

Table 1-1. 200-UP-1 Data Validation, List of Samples Validated.

DATA PACKAGE ID	HEIS NO.	SAMPLE DATE	LOCATION	COMMENTS	M	C	R	V	SV
W0004-ITC-022	B0BHZ5	07-Mar-94	299-W19-35		X	X	X	X	X
W0004-ITC-022	B0BHZ6*	08-Mar-94	299-W19-35		X	X	X	X	X
W0004-ITC-022	B0BHZ7	16-Mar-94	299-W19-35		X	X	X	X	X
W0004-ITC-022	B0BHZ8	16-Mar-94	299-W19-35	DUPLICATE	X	X	X	X	X
W0004-ITC-022	B0BHZ9	16-Mar-94	299-W19-35	FIELD BLANK				X	
W0004-ITC-022	B0BJ00*	16-Mar-94	299-W19-35	TRIP BLANK				X	
W0034-ITC-055	B0BJ05	14-Apr-94	299-W19-34B		X	X	X	X	X
W0034-ITC-055	B0BJ06	14-Apr-94	299-W19-34B	TRIP BLANK				X	
W0034-ITC-055	B0BJ07*	14-Apr-94	299-W19-35	EQUIP BLANK	X	X	X	X	X
W0034-ITC-055	B0BJ08	14-Apr-94	299-W19-34B	DUPLICATE	X	X	X	X	X
W0034-ITC-055	B0BJ09	14-Apr-94	299-W19-34B	FIELD BLANK				X	
W0034-ITC-055	B0BJ10	18-Apr-94	299-W19-34B		X	X	X	X	X
W0034-ITC-055	B0BJ11	26-Apr-94	299-W19-34B		X	X	X	X	X
W0034-ITC-055	B0BJ12	26-Apr-94	299-W19-34B	TRIP BLANK				X	
W0063-ITC-071	B0BJ13	09-May-94	699-38-68A		X	X	X	X	X
W0063-ITC-071	B0BJ14	09-May-94	699-38-68A	TRIP BLANK				X	
W0063-ITC-071	B0BJ15*	17-May-94	699-38-68A		X	X	X	X	X
W0083-ITC-094	B0BJ16	01-Jun-94	299-W19-34B		X	X	X	X	X
W0083-ITC-094	B0BX94	31-May-94	699-38-68A	EQUIP BLANK	X	X	X	X	X
W0083-ITC-094	B0BX96			TRIP BLANK				X	
W0083-ITC-094	B0BX97	09-Jun-94	699-38-68A		X	X	X	X	X
W0083-ITC-094	B0BX98*	09-Jun-94	699-38-68A	DUPLICATE	X	X	X	X	X
W0083-ITC-094	B0BX99	09-Jun-94		TRIP BLANK				X	
W0083-ITC-094	B0BXB0	10-Jun-94		FIELD BLANK				X	
W0118-QES-124	B0BXB1*	30-Jun-94	299-W19-34B		X	X	X	X	X
W0161-QES	B0BXB4	01-Aug-94	299-W19-34B		X	X	X	X	X
W0161-QES	B0BXB6	05-Aug-94	299-W19-34B		X	X	X	X	X
W0161-QES	B0BXB7*	05-Aug-94	299-W19-34B	TRIP BLANK				X	
W0161-QES	B0BXB7A	11-Aug-94	299-W19-34B		X	X	X	X	X
W0161-QES	B0BXB8*	11-Aug-94	299-W19-34B	TRIP BLANK				X	
W0183-QES	B0BXC0*	24-Aug-94	299-W19-34B		X	X	X	X	X
W0183-QES	B0BXC1	24-Aug-94	299-W19-34B	TRIP BLANK				X	
W0004-ITC-022	W004TB[1]	16-Mar-94	299-W19-35	TRIP BLANK				X	
W0063-ITC-071	W0063TB[1]		699-38-68A	TRIP BLANK				X	
W0010-ITC-021	B0BJ01	18-Mar-94	299-W19-35		X	X	X	X	X
W0010-ITC-021	B0BJ02	18-Mar-94	299-W19-35	EQUIP BLANK	X	X	X	X	X
W0010-ITC-021	B0BJ04	18-Mar-94	299-W19-35	TRIP BLANK				X	
W0010-ITC-021	W0010TB[1]	23-Mar-94	299-W19-35	TRIP BLANK				X	

M - metals and cyanide
C - general chemistry
R - radiochemistry
[1] No HEIS number reported.
V - volatiles
SV - semivolatiles
* Indicates samples which were 100% recalculated.

Table 1-2. Glossary of Organic Data Reporting Qualifiers.

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

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.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

Table 1-3. Glossary of Inorganic Data Reporting Qualifiers.

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

Table 1-4. Glossary of Radiochemistry Data Reporting Qualifiers.

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

2.0 VOLATILE ORGANIC ANALYSIS DATA VALIDATION SUMMARY

2.1 SUMMARY

This section presents a summary of the volatile organic data validation results and review in accordance with the WHC Statement of Work (WHC 1994) and validation procedures (WHC 1993a). Table 1-1 shows the data package identification, HEIS sample identification, sample collection date, location, sample type and analysis performed. Appendix A provides a tabular summary of all validated data and Appendix B provides a summary of the field QC data.

2.1.1 Sample Delivery Groups

Sample results from eight volatile organic data packages are included in this report:

Data Package ID	No. of Samples
W0004-ITC-022	7
W0161-QES	5
W0083-ITC-094	7
W0063-ITC-071	4
W0118-QES-124	1
W0034-ITC-055	8
W0183-QES	2
W0010-ITC-021	4

2.1.2 All Samples Validated

Samples and analytical results contained in the data packages listed above were validated to level D in accordance with the validation procedures.

2.1.3 Westinghouse Hanford Validation Guidance Used

Data validation was performed in accordance with Data Validation Procedures for Chemical Analyses (WHC 1993a).

2.1.4 Data Quality Objectives

This section provides a summary of the data in terms of defined laboratory performance criteria and project-specific data quality objectives to assure the data is acceptable for use in the 200-UP-1 Round 1 Soil Sampling task.

- **Precision.** All matrix spike/matrix spike duplicate sample RPD results were acceptable. Field duplicate RPD values were acceptable for all sample sets.

- **Accuracy.** All matrix spike/matrix spike duplicate, surrogate and internal standards recoveries were within specified control limits with the exception of 1,1-dichloroethene (see Section 2.6). Blank results were acceptable with the exception of low concentrations of some analytes (see Section 2.2.2).

- **Representativeness.** Field duplicate RPD values were acceptable for all sample sets.

- **Completeness.** Overall, 38 water samples were validated for volatiles with 1254 results reported, 1191 of which were deemed valid. This results in a completeness of 95% which meets normal work plan QAPjP objectives of 90%.

- **Comparability.** All samples were analyzed by similar methods and results were reported in common units (micrograms per kilogram, μg/Kg) facilitating comparison of the data.

2.1.5 Deficiencies Noted

Major and minor deficiencies were identified during validation which resulted in qualification of the data as described below.

2.2 ANALYTICAL METHOD

The following paragraphs summarize the method specific QC results analytical requirements for the volatiles analyses. All samples were analyzed in accordance with the CLP 3/90 SOW.

2.2.1 GC/MS Tuning and Calibration

Compliance with GC/MS tuning and calibration requirements demonstrates the analytical instrument was capable of producing acceptable quantitative results prior to the analysis of all samples. All GC/MS tuning, initial and continuing calibration requirements were met with the following exceptions:

Data Package W0063-ITC-071. Continuing calibration percent difference (%D) for bromoform and vinyl chloride.

Data Package W0004-ITC-022. Continuing calibration %D for bromomethane, 1,1-dichloroethene, and bromoform.

Data Package W0183-QES. Continuing calibration for %D bromomethane, bromoform and trans-1,3-dichloropropene.

In accordance with the data validation procedures, associated results were qualified as estimated (UJ for non-detects).

2.2.2 Blanks

2.2.2.1 Laboratory Blanks. Laboratory method blanks were analyzed at the proper frequency and results were acceptable with the exception of low concentrations of target compounds detected in the following data packages:

Data packages W0004-ITC-022, W0130-QES-143, W0083-ITC-094 and W0063-ITC-071. Acetone and methylene chloride.

Data package W0161-QES. Acetone, methylene chloride, chloroform, 2-butanone.

In accordance with the validation requirements, sample results associated with the detected blank compounds were qualified as undetected (U) for sample results less than ten times the associated blank concentration for common laboratory contaminants and less than five times for target compounds.

2.2.2.2 Field Blanks. Samples B0BJ00, B0BJ04, B0BJ06, B0BJ12, B0BJ14, B0BX96, B0BX99, B0BXB7, B0BXB8, B0BXC1, W004TB, W0010TB, and W0063TB were identified as trip blanks with low levels of common laboratory contaminants identified as follows:

- 2-butanone (3J ug/kg) in W0063TP;
- methylene chloride (2J ug/kg) in B0BJ06;
- toluene (15J ug/kg) in B0BX96;
- toluene (3J ug/kg) in B0BJ12; and
- methylene chloride (1J ug/kg) in W0010TB.

Samples B0BHZ9, B0BJ09 and B0BXB0 were identified as field blanks with methylene chloride (4J ug/kg) detected in B0BJ09.

Samples B0BJ07, B0BJ02, and B0BX94 were identified as equipment blanks with acetone (6J ug/kg) and toluene (13J ug/kg) detected in B0BX94, and methylene chloride (2J ug/kg) detected in B0BJ07.

Qualification of sample results based on field QC samples was not performed in accordance with the validation procedures.

2.3 HOLDING TIMES

All samples were analyzed within the required holding time with the exception of the following:

Data Package W0083-ITC-094. The holding time was exceeded by more than twice the maximum time allowed for samples B0BX96 and B0BX94, and the holding time was exceeded, but was less than twice the maximum, for sample B0BJ16.

Data Package W0063-ITC-071. The holding time for sample W0063TB (TRIPBLANK) was undetermined as there was no accompanying chain of custody and results were qualified as estimated due to this deficiency, (J for detects, UJ for nondetects).

In accordance with the data validation procedures, all detected results from samples exceeding the holding time were qualified as estimated (J). Non-detected results from samples exceeding the holding time by less than twice the maximum allowed were qualified as estimated (UJ). Non-detected results from samples exceeding the holding time by more than twice the maximum were qualified as unusable (UR).

2.4 ANALYTICAL ACCURACY

2.4.1 Surrogates

The surrogate recoveries for all samples were within the specified control limits.

2.4.2 Matrix Spike and Matrix Spike Duplicates

The matrix spike and matrix spike duplicate percent recoveries were all within specified control limits with the following exceptions:

Data Package W0183-QES. The percent recovery (%R) for chloromethane, bromomethane, vinyl chloride, chloroethane, 1,1-dichloroethene, 1,2-dichloroethene, chloroform, 1,2-dichloroethane, 1,2-dichloropropane, cis-1,3-dichloropropene and bromoform was less than the control limits.

In accordance with the data validation procedures, associated compounds, as defined in the validation procedures, were qualified as estimated (UJ for non-detects).

2.4.3 Internal Standards Performance

All internal standard retention times and areas were within the specified control limits for all samples.

2.5 ANALYTICAL PRECISION

2.5.1 Matrix Spike/Matrix Spike Duplicates

The matrix spike and matrix spike duplicate relative percent differences were within the specified control limits for all data packages.

2.5.2 Field Duplicates

A total of three samples were identified as field duplicates and were analyzed for target compound list (TCL) volatile organics. Appendix B presents a summary of the primary and duplicate sample results and the calculated RPD values. All RPD values were compared to the limits of $\leq$35% and within the range of plus or minus two CRQL units and were acceptable.

2.5.3 Field Splits

No samples analyzed for TCL volatile organics were identified as field splits.

2.6 COMPOUND IDENTIFICATION

The compound identification and confirmation were acceptable for all validated samples.

2.7 SAMPLE RESULT QUANTITATION, VERIFICATION, AND REPORTED DETECTION LIMITS

All samples were verified and results for samples indicated with an asterisk(*) in Table 1-1 were recalculated and compared with the raw data and found acceptable. Correct internal standards, quantitation ions and relative response factors were used for the quantitation of validated results. Sample quantitation limits for all samples were calculated correctly and properly reported.

2.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

System performance was assessed by a review of the raw data. No indications of poor performance were noted such as shifting RIC baselines or poor chromatographic resolution.

3.0 SEMIVOLATILE ORGANIC ANALYSIS DATA VALIDATION SUMMARY

3.1 SUMMARY

This section presents a summary of the semivolatile organic data validation results and review in accordance with the WHC Statement of Work (WHC 1994) and validation procedures (WHC 1993a). Table 1-1 shows the data package identification, HEIS sample identification, sample collection date, location and sample type and analysis performed. Appendix C provides a tabular summary of all validated data and Appendix D provides a summary of the field QC data.

3.1.1 Sample Delivery Groups

Sample results from eight volatile organic data packages are included in this report:

Data Package ID	No. of Samples
W0004-ITC-022	4
W0161-QES	3
W0083-ITC-094	4
W0063-ITC-071	2
W0118-QES-124	1
W0034-ITC-055	5
W0183-QES	1
W0010-ITC-021	2

3.1.2 All Samples Validated

Samples and analytical results contained in the data packages listed above were validated to level D in accordance with the validation procedures.

3.1.3 Westinghouse Hanford Validation Guidance Used

Data validation was performed in accordance with Data Validation Procedures for Chemical Analyses (WHC 1993a).

3.1.4 Data Quality Objectives

This section provides a summary of the data in terms of defined laboratory performance criteria and project-specific data quality objectives to assure the data is acceptable for use in the 200-UP-1 Round 1 Soil Sampling task.

- **Precision.** All matrix spike/matrix spike duplicate sample RPD results were acceptable and within control limits. Field duplicate RPD values were acceptable for all sample sets.

- **Accuracy.** All matrix spike/matrix spike duplicate, surrogate and internal standards were within specified control limits. Blank results were acceptable with the exception of low concentrations of some analytes (see Section 3.2.2).

- **Representativeness.** Field duplicate RPD values were acceptable for all sample sets.

- **Completeness.** Overall, 22 soil samples were validated for semivolatiles with 1408 results reported, of which all were deemed valid. This results in a completeness of 100% which meets normal work plan QAPjP objectives of 90%.

- **Comparability.** Samples were analyzed by similar methods and results were reported in common units (micrograms per kilogram, μg/Kg) facilitating comparison of the data.

3.1.5 Deficiencies Noted

There were no major deficiencies identified during validation. Minor deficiencies were identified which resulted in qualification of the data as described below.

3.2 ANALYTICAL METHOD

The following paragraphs summarize the method specific QC results analytical requirements for the semivolatiles analyses. All samples were analyzed in accordance with the CLP 3/90 SOW.

3.2.1 GC/MS Tuning and Calibration

Compliance with equipment systems requirements demonstrates the analytical instrument was capable of producing acceptable quantitative results prior to the analysis of all samples. All GC/MS tuning requirements were met. All initial calibrations were acceptable. All continuing calibrations were acceptable with the following exceptions:

Data Package W0161-QES. The continuing calibration %D result for acenaphthylene was greater than the control limit.

Data Package W0083-ITC-094. The continuing calibration %D result for n-nitroso-di-n-propylamine, pentachlorophenol, benzo(b)fluoranthene, and benzo(k)fluoranthene was greater than the control limit.

Data Package W0004-ITC-022. The continuing calibration %D result for 4-methylphenol, hexachlorobenzene, and benzo(k)fluoranthene was greater than the control limit.

Data Package W0063-ITC-071. The continuing calibration %D result for chrysene was greater than the control limit.

In accordance with the validation requirements, sample results have been qualified as estimated (UJ for nondetects).

3.2.2 Blanks

3.2.2.1 Laboratory Blanks. Laboratory method blanks were analyzed at the proper frequency and results were acceptable with the exception of low concentrations of target compounds detected in the following data packages:

Data Package W0118-QES-124. Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the associated method blanks.

Data Package W0161-QES. Di-n-butylphthalate was detected in the associated method blanks.

Data Package W0010-ITC-021. Bis(2-ethylhexyl)phthalate was detected in the associated method blank.

Data Package W0034-ITC-055. Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the associated method blanks.

In accordance with the validation requirements, sample results associated with the detected blank compounds were qualified as undetected (U) for sample results less than ten times the associated blank concentration since all blank contaminants were considered common laboratory contaminants.

3.2.2.2 Field Blanks. Samples B0BJ07, B0BJ02, and B0BX94 were identified as equipment blanks. Bis(2-ethylhexyl)phthalate (74J ug/kg) and di-n-butylphthalate (47J ug/kg) were detected in sample B0BJ07.

Qualification of sample results based on field QC samples was not performed in accordance with the validation procedures.

3.3 HOLDING TIMES

All validated samples were analyzed within the required holding time with the exception of the following:

Data Package W0083-ITC-094. Samples B0BJ16 and B0BX94 exceeded the holding time for extraction by greater than 14 days but less than 28 days.

In accordance with the validations requirements, sample results associated with the above holding times have been qualified as estimated (UJ) for nondetects.

3.4 ANALYTICAL ACCURACY

3.4.1 Surrogates

The surrogate recoveries for all samples were within the specified control limits.

3.4.2 Matrix Spike and Matrix Spike Duplicates

The matrix spike and matrix spike duplicate percent recoveries for all data packages were within the specified control limits.

3.4.3 Internal Standards Performance

All internal standard retention times and areas were within the specified control limits for all samples.

3.5 ANALYTICAL PRECISION

3.5.1 Matrix Spike/Matrix Spike Duplicates

The matrix spike and matrix spike duplicate relative percent differences were within the specified control limits for all data packages.

3.5.2 Field Duplicates

Samples B0BHZ8, B0BX98, and B0BJ08 were identified as field duplicates and analyzed for target compound list (TCL) semivolatile organics. Appendix D presents a summary of the primary and duplicate sample results and the calculated RPD values. All RPD values were compared to the limits of $\leq$35% and within the range of plus or minus two CRQL units and were acceptable.

3.6 COMPOUND IDENTIFICATION

Compound identification and confirmation were acceptable for all validated samples.

3.7 SAMPLE RESULT QUANTITATION, VERIFICATION, AND REPORTED DETECTION LIMITS

All samples were verified and results for samples indicated with an asterisk(*) in Table 1-1 were recalculated and compared with the raw data and found acceptable. Correct internal standards, quantitation ions and relative response factors were used for the quantitation of validated results. Sample quantitation limits for all samples were calculated correctly and properly reported.

3.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

System performance was assessed by a review of the raw data. No indications of poor performance were noted such as shifting reconstructed ion chromatogram (RIC) baselines or poor chromatographic resolution.

4.0 METALS DATA VALIDATION SUMMARY

4.1 SUMMARY

This section presents a summary of the metals data validation results and review in accordance with the WHC Statement of Work (WHC 1994) and validation procedures (WHC 1993a). Table 1-1 shows the data package identification, HEIS sample identification, sample collection date, location, sample type and analysis performed. Appendix E provides a tabular summary of all validated data and Appendix F provides a summary of the field QC data.

4.1.1 Sample Delivery Groups

Sample results from seven metals data packages are included in this report:

Data Package ID	No. of Samples
W0004-ITC-022	4
W0034-ITC-055	5
W0083-ITC-094	4
W0063-ITC-071	2
W0161-QES	3
W0183-QES	1
W0118-QES-124	1
W0010-ITC-021	2

4.1.2 All Samples Validated

Samples and analytical results contained in the data packages listed above were validated to level D in accordance with the validation procedures.

4.1.3 Westinghouse Hanford Validation Guidance Used

Data validation was performed in accordance with Data Validation Procedures for Chemical Analyses (WHC 1993a).

4.1.4 Data Quality Objectives

This section provides a summary of the data in terms of defined laboratory performance criteria and project-specific data quality objectives to assure the data is acceptable for use in the 200-UP-1 Round 1 Soil Sampling.

In accordance with the validation procedures, samples were not qualified based on field blank results.

4.3 HOLDING TIMES

Holding time requirements were acceptable with the following exceptions:

Data Package W0083-ITC-094, W0161-QES, and W0118-QES-124. The holding time for cyanide was exceeded by less than two times the maximum holding time.

In accordance with validation procedures, associated sample results were qualified as estimated (UJ for non-detects).

4.4 ANALYTICAL ACCURACY

4.4.1 Spike Samples

Matrix spike percent recoveries (%R) were acceptable with the exception of the following which were out of the 75% to 125% control limits:

Data Package W0004-ITC-022. The %R for antimony and selenium was <75% but >30%.

Data Package W0118-QES-124. The %R for antimony, cadmium, chromium, and manganese was <75% but >30%.

Data Package W0183-QES. The %R for antimony and manganese was <75% but >30%.

Data Package W0161-QES. The %R for silver was <75% but >30%.

Data Package W0063-ITC-071. The %R for antimony, thallium, and cyanide was <75% but >30%.

Data Package W0034-ITC-055. The %R for cyanide was <75% but >30%.

Data Package W0010-ITC-021. The %R for arsenic was <75% but >30%.

In accordance with the validation procedures, associated sample results were qualified as estimated (J or BJ for detects, UJ for non-detects).

4.4.2 Laboratory Control Samples

All laboratory control sample percent recoveries were within the solid matrix control limits specified in all data packages.

4.5 ANALYTICAL PRECISION

4.5.1 Laboratory Duplicates

The laboratory duplicate relative percent differences were within the specified control limits with the following exceptions:

Data Package W0161-QES. Calcium, manganese, and titanium.

Data Package W0183-QES. Chromium.

Data Package W0118-QES-124. Aluminum, chromium, manganese, iron, and magnesium.

In accordance with the validation procedures, associated detected sample results were qualified as estimated (J).

4.5.2 Serial Dilution

The serial dilution %D results were within the specified limit of 10% for sample results > 50 times (50X) the instrument detection limit (IDL) with the exception of the following:

Data Package W0183-QES. Iron.

Data Package W0183-QES. Aluminum, iron, and magnesium.

In accordance with the validation procedures, associated sample results were qualified as estimated (J) for detects greater than 50xIDL.

4.5.2 Field Duplicates

Samples B0BJ08, B0BX98, and B0BHZ8 were identified as field duplicates. Appendix F presents a summary of the primary and duplicate sample results and the calculated RPD values. All RPD values were compared to the limits of $\leq$35% and within the range of plus or minus two CRDL units, and were acceptable.

4.6 GRAPHITE FURNACE PERFORMANCE

4.6.1 Analytical Spikes

Analytical spikes were performed to determine the accuracy of the quantitation of graphite furnace results. All analytical spike recoveries were within the specified limits of 85% to 115% with the exception of the following:

Data Package W0183-QES. Thallium.

Date Package W0161-QES. Arsenic, selenium, and thallium.

Data Package W0034-ITC-055. Selenium and thallium.

Data Package W0083-ITC-094. Arsenic, selenium, and thallium.

Data Package W0063-ITC-071. Selenium and thallium.

Data Package W0004-ITC-022. Selenium.

In accordance with data validation procedures, results were qualified as estimated (J for detects, UJ for non-detects).

4.6.1.1 Method of Standard Additions. Samples with instrument absorbance results that are greater than 50% of the analytical spike absorbance and have unacceptable analytical spike recoveries are required to be analyzed by the method of standard additions (MSA) with a correlation coefficient of >0.995. All samples were analyzed by MSA when required and all correlation coefficients were >0.995 with the exception of the following:

Data Package W0161-QES. Arsenic.

In accordance with data validation procedures, associated sample results were qualified as estimated (BJ for detects >IDL but <CRDL).

4.7 SAMPLE RESULT QUANTITATION, VERIFICATION, AND REPORTED DETECTION LIMITS

All samples were verified and results for samples indicated with an asterisk(*) in Table 1-1 were recalculated and compared with the raw data and found acceptable. Sample detection limits were calculated properly and were consistent with method detection limit requirements.

4.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

System performance was assessed by a review of the raw data with no indications of poor performance noted

5.0 GENERAL CHEMISTRY DATA VALIDATION SUMMARY

5.1 SUMMARY

This section presents a summary of the general chemistry data validation results and review in accordance with the WHC Statement of Work (WHC 1994) and validation procedures (1993a). Table 1-1 shows the data package identification, HEIS sample identification, sample collection date, location, sample type and analysis performed. Appendix G provides a tabular summary of all validated data and Appendix H provides a summary of the field QC data.

5.1.1 Six Sample Delivery Groups

Sample results from six general chemistry data packages are included in this report:

Data Package ID	No. of Samples
W0004-ITC-022	4
W0034-ITC-055	5
W0083-ITC-094	4
W0063-ITC-071	2
W0161-QES	3
W0118-QES-124	1
W0010-ITC-021	2

5.1.2 All Samples Validated

Results for the data packages listed above were validated to level D as described in the validation procedures.

5.1.3 Westinghouse Hanford Validation Guidance Used

Data validation was performed in accordance with Data Validation Procedures for Chemical Analyses (WHC 1993a).

5.1.4 Data Quality Objectives

This section provides a summary of the data in terms of defined laboratory performance criteria and project-specific data quality objectives to assure the data is acceptable for use in the 200-UP-1 Round 1 Soil Sampling.

- **Precision.** Laboratory and field duplicate RPD results were acceptable with the exception of chloride (see Section 5.5).

- **Accuracy.** Laboratory spike recoveries were acceptable with the exception of sulfate, chloride and fluoride (see Section 5.4). Blank results were acceptable with the exception of low concentrations of analytes (see Section 5.2.2).

- **Representativeness.** Field duplicate RPD values were acceptable with the exception of chloride (see Section 5.5).

- **Completeness.** Overall, 21 samples were validated for general chemistry with 146 results reported, of which 138 were deemed valid. This results in a completeness of 95% which meets normal work plan completeness objectives of 90%. Two samples, B0BJ01 and B0BJ02 were not analyzed for nitrate, nitrite and phosphate as requested on the chain-of-custody due to an oversight by the laboratory.

- **Comparability.** Samples were analyzed by similar methods and all results were reported in common units (mg/kg) facilitating comparison of the data.

5.1.5 Deficiencies Noted

Major and minor deficiencies were identified requiring qualifications of the data as unusable or estimated and are explained in greater detail below.

5.2 ANALYTICAL METHOD

The following paragraphs summarize the method specific QC results for the general chemistry analyses. All samples were analyzed in accordance with the approved EPA methodologies specified in the project work plan.

5.2.1 Initial and Continuing Calibration

Initial and continuing calibration requirements were met for all analyses in all data packages.

5.2.2 Blanks

5.2.2.1 Laboratory Blanks. Laboratory method blanks were analyzed at the proper frequency and results were undetected.

5.2.2.2 Equipment Blanks. Samples B0BX94, B0BJ02, and B0BJ07 were identified as equipment blanks. Chloride (3.8 mg/kg), nitrate (0.5J mg/kg), and sulfate (2.7 mg/kg) were detected in sample B0BX94. Chloride (4.7J mg/kg) and fluoride (1.4 mg/kg) were detected in sample B0BJ07. Fluoride (0.44 mg/kg), chloride (3.3J mg/kg) and sulfate (1.7 mg/kg) were detected in sample B0BJ02.

5.3 HOLDING TIMES

Holding time requirements were acceptable with the exception of nitrate, nitrite, and phosphate in one of the six data packages.

Data Package W0083-ITC-094. The holding time for nitrite and phosphate analysis was exceeded by more than two times the maximum holding time. Sample results were verified as undetected and qualified unusable (UR). The holding time for nitrate analysis was exceeded by more than two times the maximum holding time. Sample results were verified as detected and qualified as estimated (J).

5.4 ANALYTICAL ACCURACY

5.4.1 Spike Samples

Spike sample percent recoveries (%R) were acceptable with the exception of the following which were out of the 75% to 125% control limits, but greater than 30%:

Data Package W0004-ITC-022. The %R for fluoride exceeded the 125% control limit.

Data Package W0034-ITC-055. The %R for chloride was <75% but >30%.

Data Package W0010-ITC-021. The %R for chloride and sulfate was <75% but >30%.

In accordance with the validation procedures, sample results were qualified as estimated (J for detects [fluoride only] and J for detects, UJ for non-detects for chloride and sulfate).

5.4.2 Laboratory Control Samples

All laboratory control sample percent recoveries were within the control limits of 80% to 120% for all data packages.

5.5 ANALYTICAL PRECISION

5.5.1 Laboratory Duplicates

The laboratory duplicate relative percent differences were within the specified control limits with the following exceptions:

Data Package W0034-ITC-055. Chloride.

Data Package W0010-ITC-021. Chloride.

In accordance with the validation procedures, sample results were qualified as estimated (J).

5.5.2 Field Duplicates

Samples B0BJ08 and B0BHZ8 were identified as field duplicates. Appendix H presents a summary of the primary and duplicate sample results and the calculated RPD values. All RPD values were compared to the limits of $\leq$35% and within the range of plus or minus two CRDL units and were acceptable with the exception of the following:

Data Package W0034-ITC-055. Chloride for samples B0BJ08/B0BJ05.

In accordance with the data validation procedures, data qualifiers were not applied based on field duplicate sample results.

5.6 SAMPLE RESULT QUANTITATION, VERIFICATION, AND REPORTED DETECTION LIMITS

All samples were verified and results for samples indicated with an asterisk(*) in Table 1-1 were recalculated and compared with the raw data and found acceptable. Sample detection limits were calculated properly and were consistent with method detection limit requirements.

5.7 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

System performance was assessed by a review of the raw data with no indications of poor performance noted

6.0 RADIOCHEMISTRY DATA VALIDATION SUMMARY

6.1 SUMMARY

This section presents a summary of the radiochemistry data validation results and review in accordance with the WHC Statement of Work (WHC 1994) and validation procedures (WHC 1993a). Table 1-1 shows the data package identification, HEIS sample identification, sample collection date, location, sample type and analysis performed. Appendix I provides a tabular summary of all validated data and Appendix J provides a summary of the field QC data.

6.1.1 Sample Delivery Groups

Sample results from eight radiochemistry data packages are included in this report:

Data Package ID	No. of Samples
W0004-ITC-022	4
W0034-ITC-055	5
W0063-ITC-071	2
W0083-ITC-094	4
W0118-QES-124	1
W0161-QES	3
W0183-QES	1
W0010-ITC-021	2

6.1.2 All Samples Validated

Samples and analytical results for the data packages listed above were validated to Level D in accordance with the validation procedures.

6.1.3 Westinghouse Hanford Validation Guidance Used

Data validation was performed in accordance with Data Validation Procedures for Radiochemical Analyses (WHC 1993b).

6.1.4 Data Quality Objectives

This section provides a summary of the data in terms of defined laboratory performance criteria and project-specific data quality objectives to assure the data is acceptable for use in the 200-UP-1 Round 1 Soil Sampling tasks.

- **Precision.** Laboratory duplicate RPD results were acceptable for all data packages with the exception of cesium-137.

  Field duplicate RPD results were $\leq$35% or within the limits of plus or minus two times the RDL for all data packages with the exception of one field duplicate pair as indicated below.

- **Accuracy.** Laboratory control sample (LCS) and matrix spike (MS) recoveries were acceptable for all data packages with the exception of LCS recoveries for neptunium-237, uranium-234/238, americium-241 and MS recoveries for neptunium-237 as indicated in Section 6.3. Blank results were acceptable with the exception of low concentrations of some analytes (see Section 6.2.2).

- **Representativeness.** Field duplicate RPDs were within the limits of $\leq$35% or within the range of plus or minus two RDL units for all results with the exception of uranium-238 and gross alpha as indicated in Section 6.4.2.

- **Completeness.** A total of 22 soil samples were validated for radiochemistry with 521 results reported and 22 requested results (carbon-14) not reported. Of the results reported, 519 were deemed valid. This results in a completeness of 99.6% which meets normal work plan objectives of 90%. However, the carbon-14 analysis was not completed and reported by the laboratory due to an insufficient amount of carbon present in the samples.

- **Comparability.** All results were reported in common units (pico-curie per gram, pCi/gm) facilitating comparison of results.

6.1.5 Deficiencies Noted

Major and minor deficiencies were identified requiring qualification of the data and are explained in greater detail below.

6.2 ANALYTICAL METHOD

The following paragraphs summarize the method specific QC results for the radiochemistry analyses. All samples were analyzed in accordance with the approved methods specified in the laboratory contract statement of work.

6.2.1 Instrument Calibration

Initial and continuing calibration requirements were met for all analyses in all data packages with the exception of the following.

Data package W0083-ITC-094. The weekly calibration check for strontium-90 analysis was out of laboratory control limits associated with sample B0BJ16.

In accordance with the validation procedures, the sample result was qualified as rejected (UR).

6.2.2 Blanks

6.2.2.1 Method Blanks. Laboratory method blanks were analyzed at the proper frequency and results were reported and verified as undetected for all analyses with the exception of the following.

Data Package W0004-ITC-022. Americium-241 was detected in the method blank.

Data Package W0010-ITC-021. Americium-241, technetium-99, and europium-152 were detected in the method blank.

Data Package W0034-ITC-055. Americium-241 was detected in the method blank.

Data Package W0063-ITC-071. Strontium-90 was detected in the method blank.

Data Package W0083-ITC-094. Radium-224/226/228 and europium-152 were detected in the method blank.

Data Package W0161-QES. Americium-241, plutonium-239/240, and gross beta were detected in the method blank.

Associated positive results with a sample concentration < 5 x blank concentration have been qualified as estimated (J).

6.2.2.2 Field Blanks. Samples B0BJ02, B0BJ07 and B0BX94 were identified as equipment blanks. Americium-241 (0.689J pCi/g), uranium-234 (0.083J pCi/g), uranium-238 (0.126J pCi/g), cobalt-58 (0.002 pCi/g), potassium-40 (0.524 pCi/g), radium-224 (0.125 pCi/g), radium-226 (0.087 pCi/g), radium-228 (0.101 pCi/g), and total strontium (0.182 pCi/g) were detected in sample B0BJ07. Uranium-234 (0.089 pCi/g), uranium-238 (0.075 pCi/g), europium-155 (0.013 pCi/g), potassium-40 (0.511 pCi/g), radium-224 (0.134J pCi/g), radium-226 (0.093J pCi/g), radium-228 (0.112J pCi/g), and uranium-238 (0.164 pCi/g) were detected in sample B0BX94. Americium-241 (0.695J pCi/g), neptunium-237 (0.018J pCi/g), uranium-234 (0.082 pCi/g), uranium-238 (0.031 pCi/g), and gross beta (3.04 pCi/g) were detected in sample B0BJ02.

In accordance with the validation requirements, no qualification was required for field blank contamination.

6.2.3 Holding Times

Holding time requirements were met for all samples in all data packages.

6.3 ANALYTICAL ACCURACY

6.3.1 Laboratory Control Samples

Laboratory control (blank spike) samples were analyzed at the required frequency and all results were within control limits with the exception of the following:

Data Package W0010-ITC-021. Neptunium-237 recovery was less than 70% but greater than 30%.

Data Package W0004-ITC-022. Neptunium-237 recovery was greater than 130%.

Data Package W0034-ITC-055. Uranium-234 and uranium-238 recoveries were greater than 130%.

Data Package W0063-ITC-071. Americium-241 recovery was less than 70% but greater than 30%.

Data Package W0083-ITC-094. Neptunium-237 recovery was less than 70% but greater than 30%.

Data Package W0118-QES-124. Neptunium-237 recovery was less than 70% but greater than 30%.

Data Package W0161-QES. Neptunium-237 recovery was less than 70% but greater than 30%.

Data Package W0183-QES. Neptunium-237 recovery was less than 70% but greater than 30% and uranium-235 recovery was less than 30%.

In accordance with the validation requirements, positive results associated with LCS recoveries greater than 130% were qualified as estimated (J), sample results associated with LCS recoveries less than 70% but greater than 30% were qualified as estimated (J for detected results/UJ for undetected results), and sample results associated with LCS recoveries less than 30% were rejected (R for detected results/UR for undetected results).

6.3.2 Matrix Spikes

Matrix spike samples were analyzed in addition to blank spikes and all results were within control limits with the exception of the following.

Data Package W0034-ITC-055. Neptunium-237 recovery was less than 60% but greater than 10%.

Data Package W0063-ITC-071. Neptunium-237 recovery was less than 60% but greater than 10%.

In accordance with the validation requirements, sample results associated with matrix spike recoveries less than 60% but greater than 10% are qualified as estimated (J for detected results/UJ for undetected results).

6.3.3 Chemical and Tracer Recoveries

Chemical and tracer recoveries were acceptable for all analyses with the exception of the following:

Data Package W0010-ITC-021. Tracer recovery for americium/curium in sample B0BJ01 was less than 20% but greater than 5%.

Data Package W0083-ITC-094. Plutonium-242 tracer recovery was less than 20% but greater than 5% for isotopic plutonium analysis in sample B0BJ16.

Data Package W0183-QES. Uranium-232 tracer recovery was less than 20% but above 5% for isotopic uranium analysis in sample B0BXC0.

In accordance with the validation requirements, tracer recoveries less than 20% but greater than 5% were qualified as estimated (J for detected results/UJ for undetected results).

6.4 ANALYTICAL PRECISION

6.4.1 Laboratory Duplicates

Laboratory duplicate relative percent difference (RPD) values were within the required control limits for all data packages with the following exception:

Data Package W0010-ITC-021. The RPD for cesium-137 was greater than plus or minus two RDL units.

6.4.2 Field Duplicates

Three field duplicate samples were evaluated as part of this data set and results are shown in Appendix J. The results are within the evaluation criteria of $\leq$35% RPD or within the range of plus or minus two RDL units with the following exceptions.

Data Package W0083-ITC-094. Gross alpha and uranium-238 (by gamma spectroscopy) exceeded the 35% limit for the field duplicate pair, B0BX97 and B0BX98.

In accordance with the validation requirements, qualification of associated samples based on field duplicate precision is not required.

6.4.3 Field Splits

No field split samples were evaluated as part of this data set.

6.5 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

All samples were verified and results for samples indicated with an asterisk(*) in Table 1-1 were recalculated and compared with the raw data and found acceptable. Validated results were calculated using the proper detectors, efficiencies and background counts. Minimum detectable activities (MDAs) met required detection limits and were calculated properly with the exception of the MDAs identified below.

Data Package W0004-ITC-022. Uranium-234/235/238 results and neptunium-237, total strontium, and technetium-99 MDAs could not be confirmed by recalculation.

Data Package W0010-ITC-021. Neptunium-237, total strontium, and technetium-99. MDAs could not be confirmed by recalculation and the RDL for iron-59 was not met for sample B0BJ01.

In accordance with the validation requirements, associated results and MDAs that could not be verified were qualified as estimated (J for detected results/UJ for undetected results).

6.6 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

System performance was assessed by a review of the raw data and no indications of poor performance were noted.

7.0 REFERENCES

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

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Statement of Work, MSH-SWV-315905, August 10, 1994, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX A

VOLATILE ORGANIC VALIDATED DATA SUMMARY TABLES

Parameter	Samp# / Date / Location / Depth / Type / Comments	BOBHZ5 3-7-94 299-W19-35 158.00 - 160.50 SOIL		BOBHZ6 3-8-94 299-W19-35 179.00 - 181.00 SOIL		BOBHZ7 3-16-94 299-W19-35 236.00 - 238.50 SOIL		BOBHZ8 3-16-94 299-W19-35 236.00 - 238.50 SOIL DUPLICATE		BOBHZ9 3-16-94 299-W19-35 --- SOIL FIELD BLANK		BOBJ05 4-14-94 299-W19-34B 168.00 - 170.50 SOIL	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
BROMOMETHANE	UG/KG	12.000	UJ	11.000	UJ	10.000	U	10.000	U	10.000	U	11.000	U
VINYL CHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
CHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
METHYLENE CHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	2.000	J
ACETONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
CARBON DISULFIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,1-DICHLOROETHENE	UG/KG	12.000	UJ	11.000	UJ	10.000	U	10.000	U	10.000	U	11.000	U
1,1-DICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
CHLOROFORM	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,2-DICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
2-BUTANONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,1,1-TRICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
CARBON TETRACHLORIDE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
BROMODICHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,2-DICHLOROPROPANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
TRICHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
DIBROMOCHLOROMETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,1,2-TRICHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
BENZENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
BROMOFORM	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
4-METHYL-2-PENTANONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
2-HEXANONE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
TETRACHLOROETHENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
TOLUENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
CHLOROBENZENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
ETHYLBENZENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
STYRENE	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	11.000	U
XYLENES (TOTAL)	UG/KG	12.000	U	11.000	U	10.000	U	10.000	U	10.000	U	3.000	J

The decimal places shown do not reflect the precision reported by the laboratory

	Samp#	B0BJ13		B0BJ14		B0BJ15		B0BJ16		B0BX97		B0BXB1	
	Date	5-9-94		5-9-94		5-17-94		6-1-94		6-9-94		6-30-94	
	Location	699-38-68A		699-38-68A		699-38-68A		299-W19-34B		699-38-68A		299-W19-34B	
	Depth	185.00 - 187.00		---		216.00 - 218.00		332.00 - 334.00		285.00 - 287.00		416.00 - 417.50	
	Type	SOIL		---		SOIL		SOIL		SOIL		SOIL	
	Comments			TRIP BLANK									
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
BROMOMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
VINYL CHLORIDE	UG/KG	12.000	UJ	10.000	UJ	11.000	U	12.000	UJ	11.000	U	12.000	U
CHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
METHYLENE CHLORIDE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	23.000	U	12.000	U
ACETONE	UG/KG	8.000	J	10.000	U	19.000	U	13.000	J	13.000	U	5.000	J
CARBON DISULFIDE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,1-DICHLOROETHENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,1-DICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
CHLOROFORM	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,2-DICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
2-BUTANONE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,1,1-TRICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
CARBON TETRACHLORIDE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
BROMODICHLOROMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,2-DICHLOROPROPANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
TRICHLOROETHENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
DIBROMOCHLOROMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,1,2-TRICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
BENZENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
BROMOFORM	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
4-METHYL-2-PENTANONE	UG/KG	5.000	J	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
2-HEXANONE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
TETRACHLOROETHENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
TOLUENE	UG/KG	12.000	U	10.000	U	11.000	U	17.000	J	11.000	U	12.000	U
CHLOROBENZENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
ETHYLBENZENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
STYRENE	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U
XYLENES (TOTAL)	UG/KG	12.000	U	10.000	U	11.000	U	12.000	UJ	11.000	U	12.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1573

	Samp#	B0BXB4		B0BXB6		B0BXB7		B0BXB7A		B0BXB8		W0063TB	
	Date	8-1-94		8-5-94		8-5-94		8-11-94		8-11-94			
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		699-38-68A	
	Depth	440.00 - 442.00		460.00 - 462.00		---		480.50 - 481.50		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		---	
	Comments					TRIP BLANK				TRIP BLANK		TRIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
BROMOMETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
VINYL CHLORIDE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
CHLOROETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
METHYLENE CHLORIDE	UG/KG	12.000	U	12.000	U	10.000	U	16.000		10.000	U	10.000	UJ
ACETONE	UG/KG	12.000	U	14.000	U	10.000	U	14.000	U	13.000	U	10.000	UJ
CARBON DISULFIDE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,1-DICHLOROETHENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,1-DICHLOROETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,2-DICHLOROETHENE (TOTAL)	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
CHLOROFORM	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,2-DICHLOROETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
2-BUTANONE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	3.000	J
1,1,1-TRICHLOROETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
CARBON TETRACHLORIDE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
BROMODICHLOROMETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,2-DICHLOROPROPANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
CIS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
TRICHLOROETHENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
DIBROMOCHLOROMETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,1,2-TRICHLOROETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
BENZENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
TRANS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
BROMOFORM	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
4-METHYL-2-PENTANONE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
2-HEXANONE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
TETRACHLOROETHENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
1,1,2,2-TETRACHLOROETHANE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
TOLUENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
CHLOROBENZENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
ETHYLBENZENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
STYRENE	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ
XYLENES (TOTAL)	UG/KG	12.000	U	12.000	U	10.000	U	13.000	U	10.000	U	10.000	UJ

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1574

	Samp#	B0BJ00		B0BJ01		B0BJ02		B0BJ04		B0BJ06		B0BJ07	
	Date	3-16-94		3-18-94		3-18-94		3-18-94		4-14-94		4-14-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-34B		299-W19-34B	
	Depth	---		245.00 - 247.00		---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	TRIP BLANK				EQUIP. BLANK		TRIP BLANK		TRIP BLANK		EQUIP.BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMOMETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
VINYL CHLORIDE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	2.000	J	2.000	J
ACETONE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CARBON DISULFIDE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROFORM	UG/KG	10.000	U	2.000	J	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
2-BUTANONE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BENZENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
BROMOFORM	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
2-HEXANONE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
TOLUENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
CHLOROBENZENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
ETHYLBENZENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
STYRENE	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	11.000	U	10.000	U	10.000	U	10.000	U	10.000	U

The decimal places shown do not reflect the precision reported by the laboratory

	Samp#	B0BJ08		B0BJ09		B0BJ10		B0BJ11		B0BJ12		B0BX94	
	Date	4-14-94		4-14-94		4-18-94		4-26-94		4-26-94		5-31-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		699-38-68A	
	Depth	168.00 - 170.50		---		186.00 - 188.50		242.50 - 244.50		---		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	DUPLICATE		FIELD BLANK						TRIP BLANK		EQUIP.BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
BROMOMETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
VINYL CHLORIDE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
CHLOROETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
METHYLENE CHLORIDE	UG/KG	2.000	J	4.000	J	2.000	J	16.000	U	14.000	U	10.000	UR
ACETONE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	6.000	J
CARBON DISULFIDE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,1-DICHLOROETHENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,1-DICHLOROETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,2-DICHLOROETHENE (TOTAL)	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
CHLOROFORM	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,2-DICHLOROETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
2-BUTANONE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,1,1-TRICHLOROETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
CARBON TETRACHLORIDE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
BROMODICHLOROMETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,2-DICHLOROPROPANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
CIS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
TRICHLOROETHENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
DIBROMOCHLOROMETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,1,2-TRICHLOROETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
BENZENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
TRANS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
BROMOFORM	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
4-METHYL-2-PENTANONE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
2-HEXANONE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
TETRACHLOROETHENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
1,1,2,2-TETRACHLOROETHANE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
TOLUENE	UG/KG	11.000	U	14.000	U	11.000	U	3.000	J	3.000	J	13.000	J
CHLOROBENZENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
ETHYLBENZENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
STYRENE	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR
XYLENES (TOTAL)	UG/KG	11.000	U	14.000	U	11.000	U	16.000	U	14.000	U	10.000	UR

The decimal places shown do not reflect the precision reported by the laboratory

9613174.1576

	Samp#	B0BX96		B0BX98		B0BX99		B0BXB0		B0BXC0		B0BXC1	
	Date			6-9-94		6-9-94		6-10-94		8-24-94		8-24-94	
	Location			699-38-68A						299-W19-34B		---	
	Depth	---		285.00 - 287.00		---		---		530.00 - 531.30		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments	TRIP BLANK		DUPLICATE		TRIP BLANK		FIELD BLANK				TRIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
BROMOMETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
VINYL CHLORIDE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
CHLOROETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
METHYLENE CHLORIDE	UG/KG	10.000	UR	28.000	U	16.000	U	17.000	U	11.000	U	10.000	U
ACETONE	UG/KG	10.000	UR	18.000	U	11.000	U	10.000	U	11.000	U	10.000	U
CARBON DISULFIDE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
1,1-DICHLOROETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
CHLOROFORM	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
1,2-DICHLOROETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
2-BUTANONE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
TRICHLOROETHENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
BENZENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
BROMOFORM	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	UJ	10.000	UJ
4-METHYL-2-PENTANONE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
2-HEXANONE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
TOLUENE	UG/KG	15.000	J	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
CHLOROBENZENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
ETHYLBENZENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
STYRENE	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	UR	12.000	U	10.000	U	10.000	U	11.000	U	10.000	U

The decimal places shown do not reflect the precision reported by the laboratory

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Parameter	Samp# / Date / Location / Depth / Type / Comments	W0010TB 3-23-94 299-W19-35 --- WATER (in UG/L) TRIP BLANK		W004TB 3-16-94 299-W19-35 --- SOIL TRIP BLANK	
	Units	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	10.000	U	10.000	U
BROMOMETHANE	UG/KG	10.000	U	10.000	U
VINYL CHLORIDE	UG/KG	10.000	U	10.000	U
CHLOROETHANE	UG/KG	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	1.000	J	10.000	U
ACETONE	UG/KG	10.000	U	14.000	U
CARBON DISULFIDE	UG/KG	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	10.000	U	10.000	U
CHLOROFORM	UG/KG	10.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	10.000	U	10.000	U
2-BUTANONE	UG/KG	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	10.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	10.000	U
TRICHLOROETHENE	UG/KG	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	10.000	U	10.000	U
BENZENE	UG/KG	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	10.000	U	10.000	U
BROMOFORM	UG/KG	10.000	U	10.000	UJ
4-METHYL-2-PENTANONE	UG/KG	10.000	U	10.000	U
2-HEXANONE	UG/KG	10.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	10.000	U	10.000	U
TOLUENE	UG/KG	10.000	U	10.000	U
CHLOROBENZENE	UG/KG	10.000	U	10.000	U
ETHYLBENZENE	UG/KG	10.000	U	10.000	U
STYRENE	UG/KG	10.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	10.000	U	10.000	U

The decimal places shown do not reflect the precision reported by the laboratory

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APPENDIX B

VOLATILE ORGANIC FIELD DUPLICATE SUMMARY

FIELD DUPLICATE SAMPLES, µg/Kg						
HEIS NO.:		B0BHZ8		B0BHZ7		
DATE:		3-16-94		3-16-94		
LOCATION:		299-W19-35		299-W19-35		
COMMENTS		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
CHLOROMETHANE	10	10	U	10	U	NC
BROMOMETHANE	10	10	U	10	U	NC
VINYL CHLORIDE	10	10	U	10	U	NC
CHLOROETHANE	10	10	U	10	U	NC
METHYLENE CHLORIDE	10	10	U	10	U	NC
ACETONE	10	10	U	10	U	NC
CARBON DISULFIDE	10	10	U	10	U	NC
1,1-DICHLOROETHENE	10	10	U	10	U	NC
1,1-DICHLOROETHANE	10	10	U	10	U	NC
1,2-DICHLOROETHENE (TOTAL)	10	10	U	10	U	NC
CHLOROFORM	10	10	U	10	U	NC
1,2-DICHLOROETHANE	10	10	U	10	U	NC
2-BUTANONE	10	10	U	10	U	NC
1,1,1-TRICHLOROETHANE	10	10	U	10	U	NC
CARBON TETRACHLORIDE	10	10	U	10	U	NC
BROMODICHLOROMETHANE	10	10	U	10	U	NC
1,2-DICHLOROPROPANE	10	10	U	10	U	NC
CIS-1,3-DICHLOROPROPENE	10	10	U	10	U	NC
TRICHLOROETHENE	10	10	U	10	U	NC
DIBROMOCHLOROMETHANE	10	10	U	10	U	NC
1,1,2-TRICHLOROETHANE	10	10	U	10	U	NC
BENZENE	10	10	U	10	U	NC
TRANS-1,3-DICHLOROPROPENE	10	10	U	10	U	NC
BROMOFORM	10	10	U	10	U	NC
4-METHYL-2-PENTANONE	10	10	U	10	U	NC
2-HEXANONE	10	10	U	10	U	NC
TETRACHLOROETHENE	10	10	U	10	U	NC
1,1,2,2-TETRACHLOROETHANE	10	10	U	10	U	NC
TOLUENE	10	10	U	10	U	NC
CHLOROBENZENE	10	10	U	10	U	NC
ETHYLBENZENE	10	10	U	10	U	NC
STYRENE	10	10	U	10	U	NC
XYLENES (TOTAL)	10	10	U	10	U	NC
NC - Not calculated						

FIELD DUPLICATE SAMPLES µg/Kg						
HEIS NO.:		B0BJ08		B0BJ05		
DATE:		4-14-94		4-14-94		
LOCATION:		299-W19-34B		299-W19-34B		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
CHLOROMETHANE	10	11	U	11	U	NC
BROMOMETHANE	10	11	U	11	U	NC
VINYL CHLORIDE	10	11	U	11	U	NC
CHLOROETHANE	10	11	U	11	U	NC
METHYLENE CHLORIDE	10	2	J	2	J	0
ACETONE	10	11	U	11	U	NC
CARBON DISULFIDE	10	11	U	11	U	NC
1,1-DICHLOROETHENE	10	11	U	11	U	NC
1,1-DICHLOROETHANE	10	11	U	11	U	NC
1,2-DICHLOROETHENE (TOTAL)	10	11	U	11	U	NC
CHLOROFORM	10	11	U	11	U	NC
1,2-DICHLOROETHANE	10	11	U	11	U	NC
2-BUTANONE	10	11	U	11	U	NC
1,1,1-TRICHLOROETHANE	10	11	U	11	U	NC
CARBON TETRACHLORIDE	10	11	U	11	U	NC
BROMODICHLOROMETHANE	10	11	U	11	U	NC
1,2-DICHLOROPROPANE	10	11	U	11	U	NC
CIS-1,3-DICHLOROPROPENE	10	11	U	11	U	NC
TRICHLOROETHENE	10	11	U	11	U	NC
DIBROMOCHLOROMETHANE	10	11	U	11	U	NC
1,1,2-TRICHLOROETHANE	10	11	U	11	U	NC
BENZENE	10	11	U	11	U	NC
TRANS-1,3-DICHLOROPROPENE	10	11	U	11	U	NC
BROMOFORM	10	11	U	11	U	NC
4-METHYL-2-PENTANONE	10	11	U	11	U	NC
2-HEXANONE	10	11	U	11	U	NC
TETRACHLOROETHENE	10	11	U	11	U	NC
1,1,2,2-TETRACHLOROETHANE	10	11	U	11	U	NC
TOLUENE	10	11	U	11	U	NC
CHLOROBENZENE	10	11	U	11	U	NC
ETHYLBENZENE	10	11	U	11	U	NC
STYRENE	10	11	U	11	U	NC
XYLENES (TOTAL)	10	11	U	3	J	200
NC - Not calculated						

FIELD DUPLICATE SAMPLES, µg/Kg						
HEIS NO.:		B0BX98		B0BX97		
DATE:		6-9-94		6-9-94		
LOCATION:		699-38-68A		699-38-68A		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
CHLOROMETHANE	10	12	U	11	U	NC
BROMOMETHANE	10	12	U	11	U	NC
VINYL CHLORIDE	10	12	U	11	U	NC
CHLOROETHANE	10	12	U	11	U	NC
METHYLENE CHLORIDE	10	28	U	23	U	NC
ACETONE	10	18	U	13	U	NC
CARBON DISULFIDE	10	12	U	11	U	NC
1,1-DICHLOROETHENE	10	12	U	11	U	NC
1,1-DICHLOROETHANE	10	12	U	11	U	NC
1,2-DICHLOROETHENE (TOTAL)	10	12	U	11	U	NC
CHLOROFORM	10	12	U	11	U	NC
1,2-DICHLOROETHANE	10	12	U	11	U	NC
2-BUTANONE	10	12	U	11	U	NC
1,1,1-TRICHLOROETHANE	10	12	U	11	U	NC
CARBON TETRACHLORIDE	10	12	U	11	U	NC
BROMODICHLOROMETHANE	10	12	U	11	U	NC
1,2-DICHLOROPROPANE	10	12	U	11	U	NC
CIS-1,3-DICHLOROPROPENE	10	12	U	11	U	NC
TRICHLOROETHENE	10	12	U	11	U	NC
DIBROMOCHLOROMETHANE	10	12	U	11	U	NC
1,1,2-TRICHLOROETHANE	10	12	U	11	U	NC
BENZENE	10	12	U	11	U	NC
TRANS-1,3-DICHLOROPROPENE	10	12	U	11	U	NC
BROMOFORM	10	12	U	11	U	NC
4-METHYL-2-PENTANONE	10	12	U	11	U	NC
2-HEXANONE	10	12	U	11	U	NC
TETRACHLOROETHENE	10	12	U	11	U	NC
1,1,2,2-TETRACHLOROETHANE	10	12	U	11	U	NC
TOLUENE	10	12	U	11	U	NC
CHLOROBENZENE	10	12	U	11	U	NC
ETHYLBENZENE	10	12	U	11	U	NC
STYRENE	10	12	U	11	U	NC
XYLENES (TOTAL)	10	12	U	11	U	NC
NC - Not calculated						

9613474.1563

APPENDIX C

SEMIVOLATILE ORGANIC VALIDATED DATA SUMMARY TABLES

Parameter	Samp# / Date / Location / Depth / Type / Comments	BOBHZ5 3-7-94 299-W19-35 158.00 - 160.50 SOIL		BOBHZ6 3-8-94 299-W19-35 179.00 - 181.00 SOIL		BOBHZ7 3-16-94 299-W19-35 236.00 - 238.50 SOIL		BOBHZ8 3-16-94 299-W19-35 236.00 - 238.50 SOIL DUPLICATE		BOBJ05 4-14-94 299-W19-34B 168.00 - 170.5 SOIL	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2-CHLOROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
1,3-DICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
1,4-DICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
1,2-DICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2-METHYLPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
4-METHYLPHENOL	UG/KG	380.000	UJ	360.000	UJ	340.000	U	340.000	U	380.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
HEXACHLOROETHANE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
NITROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
ISOPHORONE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2-NITROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,4-DIMETHYLPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,4-DICHLOROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
NAPHTHALENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
4-CHLOROANILINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
HEXACHLOROBUTADIENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2-METHYLNAPHTHALENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
2-CHLORONAPHTHALENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2-NITROANILINE	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
DIMETHYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
ACENAPHTHYLENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,6-DINITROTOLUENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
3-NITROANILINE	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
ACENAPHTHENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
2,4-DINITROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
4-NITROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
DIBENZOFURAN	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1680

	Samp#	BOBHZ5		BOBHZ6		BOBHZ7		BOBHZ8		BOBJ05	
	Date	3-7-94		3-8-94		3-16-94		3-16-94		4-14-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-34B	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50		168.00 - 170.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE			
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROTOLUENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
DIETHYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
FLUORENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
4-NITROANILINE	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
N-NITROSODIPHENYLAMINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
HEXACHLOROBENZENE	UG/KG	380.000	UJ	360.000	UJ	340.000	U	340.000	U	380.000	U
PENTACHLOROPHENOL	UG/KG	920.000	U	880.000	U	820.000	U	820.000	U	920.000	U
PHENANTHRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
ANTHRACENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
CARBAZOLE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
DI-N-BUTYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
FLUORANTHENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
PYRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BUTYLBENZYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BENZO(A)ANTHRACENE	UG/KG	380.000	UJ	360.000	U	340.000	U	340.000	U	380.000	U
CHRYSENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
DI-N-OCTYLPHTHALATE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BENZO(B)FLUORANTHENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BENZO(K)FLUORANTHENE	UG/KG	380.000	UJ	360.000	UJ	340.000	U	340.000	U	380.000	U
BENZO(A)PYRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U
BENZO(G,H,I)PERYLENE	UG/KG	380.000	U	360.000	U	340.000	U	340.000	U	380.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9513474.1585

	Samp#	B0BJ13		B0BJ15		B0BJ16		B0BX97		B0BXB1		B0BXB4	
	Date	5-9-94		5-17-94		6-1-94		6-9-94		6-30-94		8-1-94	
	Location	699-38-68A		699-38-68A		299-W19-34B		699-38-68A		299-W19-34B		299-W19-34B	
	Depth	185.00 - 187.00		216.00 - 218.00		332.00 - 334.00		285.00 - 287.00		416.00 - 417.50		440.00 - 442.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments												
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2-CHLOROPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
1,3-DICHLOROBENZENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
1,4-DICHLOROBENZENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
1,2-DICHLOROBENZENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2-METHYLPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
4-METHYLPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	UJ	400.000	U	410.000	U
HEXACHLOROETHANE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
NITROBENZENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
ISOPHORONE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2-NITROPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,4-DIMETHYLPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,4-DICHLOROPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
NAPHTHALENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
4-CHLOROANILINE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
HEXACHLOROBUTADIENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2-METHYLNAPHTHALENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
2-CHLORONAPHTHALENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2-NITROANILINE	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
DIMETHYLPHTHALATE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
ACENAPHTHYLENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,6-DINITROTOLUENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
3-NITROANILINE	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
ACENAPHTHENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
2,4-DINITROPHENOL	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
4-NITROPHENOL	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
DIBENZOFURAN	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U

The decimal places shown do not reflect the precision reported by the laboratory

	Samp#	B0BJ13		B0BJ15		B0BJ16		B0BX97		B0BXB1		B0BXB4	
	Date	5-9-94		5-17-94		6-1-94		6-9-94		6-30-94		8-1-94	
	Location	699-38-68A		699-38-68A		299-W19-34B		699-38-68A		299-W19-34B		299-W19-34B	
	Depth	185.00 - 187.00		216.00 - 218.00		332.00 - 334.00		285.00 - 287.00		416.00 - 417.50		440.00 - 442.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments												
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROTOLUENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
DIETHYLPHTHALATE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
FLUORENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
4-NITROANILINE	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1000.000	U	870.000	U	960.000	UJ	900.000	U	970.000	U	1000.000	U
N-NITROSODIPHENYLAMINE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
HEXACHLOROBENZENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
PENTACHLOROPHENOL	UG/KG	1000.000	U	880.000		960.000	UJ	900.000	UJ	970.000	U	1000.000	U
PHENANTHRENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
ANTHRACENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
CARBAZOLE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
DI-N-BUTYLPHTHALATE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
FLUORANTHENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
PYRENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
BUTYLBENZYLPHTHALATE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
BENZO(A)ANTHRACENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
CHRYSENE	UG/KG	410.000	U	360.000	UJ	400.000	UJ	370.000	U	400.000	U	410.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	410.000	U	360.000	U	110.000	J	370.000	U	400.000	U	53.000	J
DI-N-OCTYLPHTHALATE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
BENZO(B)FLUORANTHENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	UJ	400.000	U	410.000	U
BENZO(K)FLUORANTHENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	UJ	400.000	U	410.000	U
BENZO(A)PYRENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U
BENZO(G,H,I)PERYLENE	UG/KG	410.000	U	360.000	U	400.000	UJ	370.000	U	400.000	U	410.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1587

	Samp#	B0BJ01		B0BJ02		B0BJ07		B0BJ08		B0BJ10	
	Date	3-18-94		3-18-94		4-14-94		4-14-94		4-18-94	
	Location	299-W19-35		299-W19-35		299-W19-34B		299-W19-34B		299-W19-34B	
	Depth	245.00 - 247.00		---		---		168.00 - 170.50		186.00 - 188.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP. BLANK		EQUIP. BLANK		DUPLICATE			
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2-CHLOROPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
1,3-DICHLOROBENZENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
1,4-DICHLOROBENZENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
1,2-DICHLOROBENZENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2-METHYLPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
4-METHYLPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
HEXACHLOROETHANE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
NITROBENZENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
ISOPHORONE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2-NITROPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,4-DIMETHYLPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,4-DICHLOROPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
NAPHTHALENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
4-CHLOROANILINE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
HEXACHLOROBUTADIENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2-METHYLNAPHTHALENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
2-CHLORONAPHTHALENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2-NITROANILINE	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
DIMETHYLPHTHALATE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
ACENAPHTHYLENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
3-NITROANILINE	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
ACENAPHTHENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
2,4-DINITROPHENOL	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
4-NITROPHENOL	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
DIBENZOFURAN	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1566

	Samp#	B0BJ01		B0BJ02		B0BJ07		B0BJ08		B0BJ10	
	Date	3-18-94		3-18-94		4-14-94		4-14-94		4-18-94	
	Location	299-W19-35		299-W19-35		299-W19-34B		299-W19-34B		299-W19-34B	
	Depth	245.00 - 247.00		---		--		168.00 - 170.50		186.00 - 188.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP. BLANK		EQUIP. BLANK		DUPLICATE			
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROTOLUENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
FLUORENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
4-NITROANILINE	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
PENTACHLOROPHENOL	UG/KG	860.000	U	800.000	U	790.000	U	890.000	U	910.000	U
PHENANTHRENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
ANTHRACENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
CARBAZOLE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
DI-N-BUTYLPHTHALATE	UG/KG	350.000	U	330.000	U	47.000	J	49.000	J	370.000	U
FLUORANTHENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
PYRENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
CHRYSENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	330.000	U	74.000	J	370.000	U	370.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BENZO(A)PYRENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	330.000	U	330.000	U	370.000	U	370.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9413174.1589

	Samp#	BOBJ11		BOBX94		BOBX98		BOBXB6		BOBXB7A	
	Date	4-26-94		5-31-94		6-9-94		8-5-94		8-11-94	
	Location	299-W19-34B		699-38-68A		699-38-68A		299-W19-34B		299-W19-34B	
	Depth	242.50 - 244.50		---		285.00 - 287.00		460.00 - 462.00		480.50 - 481.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP BLANK		DUPLICATE					
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2-CHLOROPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
1,3-DICHLOROBENZENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
1,4-DICHLOROBENZENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
1,2-DICHLOROBENZENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2-METHYLPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
4-METHYLPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	500.000	U	330.000	UJ	410.000	UJ	400.000	U	420.000	U
HEXACHLOROETHANE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
NITROBENZENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
ISOPHORONE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2-NITROPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2,4-DIMETHYLPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2,4-DICHLOROPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
NAPHTHALENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
4-CHLOROANILINE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
HEXACHLOROBUTADIENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2-METHYLNAPHTHALENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
2-CHLORONAPHTHALENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2-NITROANILINE	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
DIMETHYLPHTHALATE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
ACENAPHTHYLENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	UJ
2,6-DINITROTOLUENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
3-NITROANILINE	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
ACENAPHTHENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
2,4-DINITROPHENOL	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
4-NITROPHENOL	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
DIBENZOFURAN	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1590

	Samp#	BOBJ11		BOBX94		BOBX98		BOBXB6		BOBXB7A	
	Date	4-26-94		5-31-94		6-9-94		8-5-94		8-11-94	
	Location	299-W19-34B		699-38-68A		699-38-68A		299-W19-34B		299-W19-34B	
	Depth	242.50 - 244.50		---		285.00 - 287.00		460.00 - 462.00		480.50 - 481.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP BLANK		DUPLICATE					
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-DINITROTOLUENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
DIETHYLPHTHALATE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
FLUORENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
4-NITROANILINE	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1200.000	U	790.000	UJ	980.000	U	980.000	U	1000.000	U
N-NITROSODIPHENYLAMINE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
HEXACHLOROBENZENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
PENTACHLOROPHENOL	UG/KG	1200.000	U	790.000	UJ	980.000	UJ	980.000	U	1000.000	U
PHENANTHRENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
ANTHRACENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
CARBAZOLE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
DI-N-BUTYLPHTHALATE	UG/KG	500.000	U	330.000	UJ	410.000	U	70.000	J	420.000	U
FLUORANTHENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
PYRENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BUTYLBENZYLPHTHALATE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BENZO(A)ANTHRACENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
CHRYSENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	500.000	U	53.000	J	81.000	J	170.000	J	420.000	U
DI-N-OCTYLPHTHALATE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BENZO(B)FLUORANTHENE	UG/KG	500.000	U	330.000	UJ	410.000	UJ	400.000	U	420.000	U
BENZO(K)FLUORANTHENE	UG/KG	500.000	U	330.000	UJ	410.000	UJ	400.000	U	420.000	U
BENZO(A)PYRENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U
BENZO(G,H,I)PERYLENE	UG/KG	500.000	U	330.000	UJ	410.000	U	400.000	U	420.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9413174.1591

Parameter	Samp# / Date / Location / Depth / Type / Comments	BOBXC0 / 8-24-94 / 299-W19-34B / 530.00 - 531.30 / SOIL	
	Units	Result	Q
PHENOL	UG/KG	380.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	380.000	U
2-CHLOROPHENOL	UG/KG	380.000	U
1,3-DICHLOROBENZENE	UG/KG	380.000	U
1,4-DICHLOROBENZENE	UG/KG	380.000	U
1,2-DICHLOROBENZENE	UG/KG	380.000	U
2-METHYLPHENOL	UG/KG	380.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	380.000	U
4-METHYLPHENOL	UG/KG	380.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	380.000	U
HEXACHLOROETHANE	UG/KG	380.000	U
NITROBENZENE	UG/KG	380.000	U
ISOPHORONE	UG/KG	380.000	U
2-NITROPHENOL	UG/KG	380.000	U
2,4-DIMETHYLPHENOL	UG/KG	380.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	380.000	U
2,4-DICHLOROPHENOL	UG/KG	380.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	380.000	U
NAPHTHALENE	UG/KG	380.000	U
4-CHLOROANILINE	UG/KG	380.000	U
HEXACHLOROBUTADIENE	UG/KG	380.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	380.000	U
2-METHYLNAPHTHALENE	UG/KG	380.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	380.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	380.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	920.000	U
2-CHLORONAPHTHALENE	UG/KG	380.000	U
2-NITROANILINE	UG/KG	920.000	U
DIMETHYLPHTHALATE	UG/KG	380.000	U
ACENAPHTHYLENE	UG/KG	380.000	U
2,6-DINITROTOLUENE	UG/KG	380.000	U
3-NITROANILINE	UG/KG	920.000	U
ACENAPHTHENE	UG/KG	380.000	U
2,4-DINITROPHENOL	UG/KG	920.000	U
4-NITROPHENOL	UG/KG	920.000	U
DIBENZOFURAN	UG/KG	380.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9513974.1592

Parameter	Units	Result	Q
Samp#		BOBXC0	
Date		8-24-94	
Location		299-W19-34B	
Depth		530.00 - 531.30	
Type		SOIL	
Comments			
2,4-DINITROTOLUENE	UG/KG	380.000	U
DIETHYLPHTHALATE	UG/KG	380.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	380.000	U
FLUORENE	UG/KG	380.000	U
4-NITROANILINE	UG/KG	920.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	920.000	U
N-NITROSODIPHENYLAMINE	UG/KG	380.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	380.000	U
HEXACHLOROBENZENE	UG/KG	380.000	U
PENTACHLOROPHENOL	UG/KG	920.000	U
PHENANTHRENE	UG/KG	380.000	U
ANTHRACENE	UG/KG	380.000	U
CARBAZOLE	UG/KG	380.000	U
DI-N-BUTYLPHTHALATE	UG/KG	51.000	J
FLUORANTHENE	UG/KG	380.000	U
PYRENE	UG/KG	380.000	U
BUTYLBENZYLPHTHALATE	UG/KG	380.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	380.000	U
BENZO(A)ANTHRACENE	UG/KG	380.000	U
CHRYSENE	UG/KG	380.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	380.000	U
DI-N-OCTYLPHTHALATE	UG/KG	380.000	U
BENZO(B)FLUORANTHENE	UG/KG	380.000	U
BENZO(K)FLUORANTHENE	UG/KG	380.000	U
BENZO(A)PYRENE	UG/KG	380.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	380.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	380.000	U
BENZO(G,H,I)PERYLENE	UG/KG	380.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9615474.1593

9613474.1594

APPENDIX D

SEMIVOLATILE ORGANIC FIELD DUPLICATE SUMMARY

FIELD DUPLICATE SAMPLES, µg/Kg						
HEIS NO.:		B0BHZ8		B0BHZ7		
DATE:		3-16-94		3-16-94		
LOCATION:		299-W19-35		299-W19-35		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
PHENOL	330	340	U	340	U	NC
BIS(2-CHLOROETHYL)ETHER	330	340	U	340	U	NC
2-CHLOROPHENOL	330	340	U	340	U	NC
1,3-DICHLOROBENZENE	330	340	U	340	U	NC
1,4-DICHLOROBENZENE	330	340	U	340	U	NC
1,2-DICHLOROBENZENE	330	340	U	340	U	NC
2-METHYLPHENOL	330	340	U	340	U	NC
2,2'-OXYBIS(1-CHLOROPROPANE)	330	340	U	340	U	NC
4-METHYLPHENOL	330	340	U	340	U	NC
N-NITROSO-DI-N-PROPYLAMINE	330	340	U	340	U	NC
HEXACHLOROETHANE	330	340	U	340	U	NC
NITROBENZENE	330	340	U	340	U	NC
ISOPHORONE	330	340	U	340	U	NC
2-NITROPHENOL	330	340	U	340	U	NC
2,4-DIMETHYLPHENOL	330	340	U	340	U	NC
BIS(2-CHLOROETHOXY)METHANE	330	340	U	340	U	NC
2,4-DICHLOROPHENOL	330	340	U	340	U	NC
1,2,4-TRICHLOROBENZENE	330	340	U	340	U	NC
NAPHTHALENE	330	340	U	340	U	NC
4-CHLOROANILINE	330	340	U	340	U	NC
HEXACHLOROBUTADIENE	330	340	U	340	U	NC
4-CHLORO-3-METHYLPHENOL	330	340	U	340	U	NC
2-METHYLNAPHTHALENE	330	340	U	340	U	NC
HEXACHLOROCYCLOPENTADIENE	330	340	U	340	U	NC
2,4,6-TRICHLOROPHENOL	330	340	U	340	U	NC
2,4,5-TRICHLOROPHENOL	1700	820	U	820	U	NC
2-CHLORONAPHTHALENE	330	340	U	340	U	NC
2-NITROANILINE	1700	820	U	820	U	NC
DIMETHYLPHTHALATE	330	340	U	340	U	NC
ACENAPHTHYLENE	330	340	U	340	U	NC
2,6-DINITROTOLUENE	330	340	U	340	U	NC
3-NITROANILINE	1700	820	U	820	U	NC
ACENAPHTHENE	330	340	U	340	U	NC
2,4-DINITROPHENOL	1700	820	U	820	U	NC
4-NITROPHENOL	1700	820	U	820	U	NC
DIBENZOFURAN	330	340	U	340	U	NC
2,4-DINITROTOLUENE	330	340	U	340	U	NC

DIETHYLPHTHALATE	330	340	U	340	U	NC
4-CHLOROPHENYL-PHENYLETHER	330	340	U	340	U	NC
FLUORENE	330	340	U	340	U	NC
4-NITROANILINE	1700	820	U	820	U	NC
4,6-DINITRO-2-METHYLPHENOL	1700	820	U	820	U	NC
N-NITROSODIPHENYLAMINE	330	340	U	340	U	NC
4-BROMOPHENYL-PHENYLETHER	330	340	U	340	U	NC
HEXACHLOROBENZENE	330	340	U	340	U	NC
PENTACHLOROPHENOL	1700	820	U	820	U	NC
PHENANTHRENE	330	340	U	340	U	NC
ANTHRACENE	330	340	U	340	U	NC
CARBAZOLE	330	340	U	340	U	NC
DI-N-BUTYLPHTHALATE	330	340	U	340	U	NC
FLUORANTHENE	330	340	U	340	U	NC
PYRENE	330	340	U	340	U	NC
BUTYLBENZYLPHTHALATE	330	340	U	340	U	NC
3,3'-DICHLOROBENZIDINE	330	340	U	340	U	NC
BENZO(A)ANTHRACENE	330	340	U	340	U	NC
CHRYSENE	330	340	U	340	U	NC
BIS(2-ETHYLHEXYL)PHTHALATE	330	340	U	340	U	NC
DI-N-OCTYLPHTHALATE	330	340	U	340	U	NC
BENZO(B)FLUORANTHENE	330	340	U	340	U	NC
BENZO(K)FLUORANTHENE	330	340	U	340	U	NC
BENZO(A)PYRENE	330	340	U	340	U	NC
INDENO(1,2,3-CD)PYRENE	330	340	U	340	U	NC
DIBENZ(A,H)ANTHRACENE	330	340	U	340	U	NC
BENZO(G,H,I)PERYLENE	330	340	U	340	U	NC
NC - Not calculated						

FIELD DUPLICATE SAMPLES, µg/Kg						
HEIS NO.:		B0BJ08		B0BJ05		
DATE:		4-14-94		4-14-94		
LOCATION:		299-W19-34B		299-W19-34B		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
PHENOL	330	370	U	380	U	NC
BIS(2-CHLOROETHYL)ETHER	330	370	U	380	U	NC
2-CHLOROPHENOL	330	370	U	380	U	NC
1,3-DICHLOROBENZENE	330	370	U	380	U	NC
1,4-DICHLOROBENZENE	330	370	U	380	U	NC
1,2-DICHLOROBENZENE	330	370	U	380	U	NC
2-METHYLPHENOL	330	370	U	380	U	NC
2,2'-OXYBIS(1-CHLOROPROPANE)	330	370	U	380	U	NC
4-METHYLPHENOL	330	370	U	380	U	NC
N-NITROSO-DI-N-PROPYLAMINE	330	370	U	380	U	NC
HEXACHLOROETHANE	330	370	U	380	U	NC
NITROBENZENE	330	370	U	380	U	NC
ISOPHORONE	330	370	U	380	U	NC
2-NITROPHENOL	330	370	U	380	U	NC
2,4-DIMETHYLPHENOL	330	370	U	380	U	NC
BIS(2-CHLOROETHOXY)METHANE	330	370	U	380	U	NC
2,4-DICHLOROPHENOL	330	370	U	380	U	NC
1,2,4-TRICHLOROBENZENE	330	370	U	380	U	NC
NAPHTHALENE	330	370	U	380	U	NC
4-CHLOROANILINE	330	370	U	380	U	NC
HEXACHLOROBUTADIENE	330	370	U	380	U	NC
4-CHLORO-3-METHYLPHENOL	330	370	U	380	U	NC
2-METHYLNAPHTHALENE	330	370	U	380	U	NC
HEXACHLOROCYCLOPENTADIENE	330	370	U	380	U	NC
2,4,6-TRICHLOROPHENOL	330	370	U	380	U	NC
2,4,5-TRICHLOROPHENOL	1700	890	U	920	U	NC
2-CHLORONAPHTHALENE	330	370	U	380	U	NC
2-NITROANILINE	1700	890	U	920	U	NC
DIMETHYLPHTHALATE	330	370	U	380	U	NC
ACENAPHTHYLENE	330	370	U	380	U	NC
2,6-DINITROTOLUENE	330	370	U	380	U	NC
3-NITROANILINE	1700	890	U	920	U	NC
ACENAPHTHENE	330	370	U	380	U	NC
2,4-DINITROPHENOL	1700	890	U	920	U	NC
4-NITROPHENOL	1700	890	U	920	U	NC
DIBENZOFURAN	330	370	U	380	U	NC
2,4-DINITROTOLUENE	330	370	U	380	U	NC

DIETHYLPHTHALATE	330	370	U	380	U	NC
4-CHLOROPHENYL-PHENYLETHER	330	370	U	380	U	NC
FLUORENE	330	370	U	380	U	NC
4-NITROANILINE	1700	890	U	920	U	NC
4,6-DINITRO-2-METHYLPHENOL	1700	890	U	920	U	NC
N-NITROSODIPHENYLAMINE	330	370	U	380	U	NC
4-BROMOPHENYL-PHENYLETHER	330	370	U	380	U	NC
HEXACHLOROBENZENE	330	370	U	380	U	NC
PENTACHLOROPHENOL	1700	890	U	920	U	NC
PHENANTHRENE	330	370	U	380	U	NC
ANTHRACENE	330	370	U	380	U	NC
CARBAZOLE	330	370	U	380	U	NC
DI-N-BUTYLPHTHALATE	330	49	J	380	U	200
FLUORANTHENE	330	370	U	380	U	NC
PYRENE	330	370	U	380	U	NC
BUTYLBENZYLPHTHALATE	330	370	U	380	U	NC
3,3'-DICHLOROBENZIDINE	330	370	U	380	U	NC
BENZO(A)ANTHRACENE	330	370	U	380	U	NC
CHRYSENE	330	370	U	380	U	NC
BIS(2-ETHYLHEXYL)PHTHALATE	330	370	U	380	U	NC
DI-N-OCTYLPHTHALATE	330	370	U	380	U	NC
BENZO(B)FLUORANTHENE	330	370	U	380	U	NC
BENZO(K)FLUORANTHENE	330	370	U	380	U	NC
BENZO(A)PYRENE	330	370	U	380	U	NC
INDENO(1,2,3-CD)PYRENE	330	370	U	380	U	NC
DIBENZ(A,H)ANTHRACENE	330	370	U	380	U	NC
BENZO(G,H,I)PERYLENE	330	370	U	380	U	NC
NC - Not calculated						

FIELD DUPLICATE SAMPLES, µg/Kg						
HEIS NO.:		B0BX98		B0BX97		
DATE:		6-9-94		6-9-94		
LOCATION:		699-38-68A		699-38-68A		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
PHENOL	330	410	U	370	U	NC
BIS(2-CHLOROETHYL)ETHER	330	410	U	370	U	NC
2-CHLOROPHENOL	330	410	U	370	U	NC
1,3-DICHLOROBENZENE	330	410	U	370	U	NC
1,4-DICHLOROBENZENE	330	410	U	370	U	NC
1,2-DICHLOROBENZENE	330	410	U	370	U	NC
2-METHYLPHENOL	330	410	U	370	U	NC
2,2'-OXYBIS(1-CHLOROPROPANE)	330	410	U	370	U	NC
4-METHYLPHENOL	330	410	U	370	U	NC
N-NITROSO-DI-N-PROPYLAMINE	330	410	UJ	370	UJ	NC
HEXACHLOROETHANE	330	410	U	370	U	NC
NITROBENZENE	330	410	U	370	U	NC
ISOPHORONE	330	410	U	370	U	NC
2-NITROPHENOL	330	410	U	370	U	NC
2,4-DIMETHYLPHENOL	330	410	U	370	U	NC
BIS(2-CHLOROETHOXY)METHANE	330	410	U	370	U	NC
2,4-DICHLOROPHENOL	330	410	U	370	U	NC
1,2,4-TRICHLOROBENZENE	330	410	U	370	U	NC
NAPHTHALENE	330	410	U	370	U	NC
4-CHLOROANILINE	330	410	U	370	U	NC
HEXACHLOROBUTADIENE	330	410	U	370	U	NC
4-CHLORO-3-METHYLPHENOL	330	410	U	370	U	NC
2-METHYLNAPHTHALENE	330	410	U	370	U	NC
HEXACHLOROCYCLOPENTADIENE	330	410	U	370	U	NC
2,4,6-TRICHLOROPHENOL	330	410	U	370	U	NC
2,4,5-TRICHLOROPHENOL	1700	980	U	900	U	NC
2-CHLORONAPHTHALENE	330	410	U	370	U	NC
2-NITROANILINE	1700	980	U	900	U	NC
DIMETHYLPHTHALATE	330	410	U	370	U	NC
ACENAPHTHYLENE	330	410	U	370	U	NC
2,6-DINITROTOLUENE	330	410	U	370	U	NC
3-NITROANILINE	1700	980	U	900	U	NC
ACENAPHTHENE	330	410	U	370	U	NC
2,4-DINITROPHENOL	1700	980	U	900	U	NC
4-NITROPHENOL	1700	980	U	900	U	NC
DIBENZOFURAN	330	410	U	370	U	NC
2,4-DINITROTOLUENE	330	410	U	370	U	NC

DIETHYLPHTHALATE	330	410	U	370	U	NC
4-CHLOROPHENYL-PHENYLETHER	330	410	U	370	U	NC
FLUORENE	330	410	U	370	U	NC
4-NITROANILINE	1700	980	U	900	U	NC
4,6-DINITRO-2-METHYLPHENOL	1700	980	U	900	U	NC
N-NITROSODIPHENYLAMINE	330	410	U	370	U	NC
4-BROMOPHENYL-PHENYLETHER	330	410	U	370	U	NC
HEXACHLOROBENZENE	330	410	U	370	U	NC
PENTACHLOROPHENOL	1700	980	UJ	900	UJ	NC
PHENANTHRENE	330	410	U	370	U	NC
ANTHRACENE	330	410	U	370	U	NC
CARBAZOLE	330	410	U	370	U	NC
DI-N-BUTYLPHTHALATE	330	410	U	370	U	NC
FLUORANTHENE	330	410	U	370	U	NC
PYRENE	330	410	U	370	U	NC
BUTYLBENZYLPHTHALATE	330	410	U	370	U	NC
3,3'-DICHLOROBENZIDINE	330	410	U	370	U	NC
BENZO(A)ANTHRACENE	330	410	U	370	U	NC
CHRYSENE	330	410	U	370	U	NC
BIS(2-ETHYLHEXYL)PHTHALATE	330	81	J	370	U	200
DI-N-OCTYLPHTHALATE	330	410	U	370	U	NC
BENZO(B)FLUORANTHENE	330	410	UJ	370	UJ	NC
BENZO(K)FLUORANTHENE	330	410	UJ	370	UJ	NC
BENZO(A)PYRENE	330	410	U	370	U	NC
INDENO(1,2,3-CD)PYRENE	330	410	U	370	U	NC
DIBENZ(A,H)ANTHRACENE	330	410	U	370	U	NC
BENZO(G,H,I)PERYLENE	330	410	U	370	U	NC
NC - Not calculated						

9613474.1601

APPENDIX E

METALS VALIDATED DATA SUMMARY TABLES

	Samp#	BOBHZ5		BOBHZ6		BOBHZ7		BOBHZ8		BOBJ01		BOBJ02	
	Date	3-7-94		3-8-94		3-16-94		3-16-94		3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50		245.00 - 247.00		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE				EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	14100.000		7160.000		4460.000		4370.000		4170.000		79.500	U
ANTIMONY	MG/KG	11.600	UJ	10.800	UJ	10.400	UJ	10.200	UJ	10.400	U	9.700	U
ARSENIC	MG/KG	7.200		2.200		0.570	B	0.480	B	0.430	BJ	0.380	UJ
BARIUM	MG/KG	96.000		117.000		39.000	B	43.600		53.300		0.410	B
BERYLLIUM	MG/KG	0.910	B	0.440	B	0.340	B	0.340	B	0.300	B	0.190	U
CADMIUM	MG/KG	1.200	U	1.100	U	1.000	U	1.000	U	1.000	U	0.970	U
CALCIUM	MG/KG	14700.000		80500.000		2220.000		2200.000		2280.000		53.600	U
CHROMIUM	MG/KG	19.100		14.200		9.600		11.200		12.800		3.100	
COBALT	MG/KG	14.500		10.100	B	7.100	B	6.700	B	6.200	B	1.900	U
COPPER	MG/KG	22.300		11.000		9.700		9.500		10.400		1.900	U
IRON	MG/KG	26800.000		18200.000		13100.000		13000.000		11700.000		141.000	
LEAD	MG/KG	19.300		0.440	U	2.700		2.600		1.600		0.380	U
MAGNESIUM	MG/KG	8750.000		5310.000		3080.000		3190.000		2910.000		10.900	U
MANGANESE	MG/KG	326.000		342.000		214.000		235.000		198.000		0.570	B
MERCURY	MG/KG	0.110	U	0.100	U	0.080	U	0.100	U	0.110	U	0.100	U
NICKEL	MG/KG	17.200		13.000		9.800		12.300		11.700		3.900	U
POTASSIUM	MG/KG	2510.000		795.000	B	699.000	B	678.000	B	871.000	B	195.000	U
SELENIUM	MG/KG	0.450	UJ	0.440	UJ	0.400	UJ	0.410	UJ	0.410	U	0.380	U
SILVER	MG/KG	1.300	B	2.000	B	1.000	U	1.000	U	1.000	U	0.970	U
SODIUM	MG/KG	165.000	B	164.000	B	123.000	B	115.000	B	278.000	B	46.600	U
THALLIUM	MG/KG	0.450	U	0.440	U	0.400	U	0.410	U	0.410	U	0.380	U
VANADIUM	MG/KG	36.600		56.200		29.800		28.800		22.200		1.900	U
ZINC	MG/KG	55.800		28.200		37.500		22.300		32.700		1.900	U
TITANIUM	MG/KG	783.000		1210.000		809.000		816.000		690.000		2.900	
CYANIDE	MG/KG	1.200	UR	1.100	UR	1.000	UR	1.000	UR	1.100	U	1.000	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1602

	Samp#	BOBJ05		BOBJ07		BOBJ08		BOBJ10		BOBJ11		BOBJ13	
	Date	4-14-94		4-14-94		4-14-94		4-18-94		4-26-94		5-9-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		699-38-68A	
	Depth	168.00 - 170.50		---		168.00 - 170.50		186.00 - 188.50		242.50 - 244.50		185.00 - 187.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP.BLANK		DUPLICATE							
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	10200.000		108.000		8930.000		6330.000		8080.000		10800.000	
ANTIMONY	MG/KG	11.500	U	10.000	U	11.100	U	11.400	U	15.400	U	12.500	UJ
ARSENIC	MG/KG	3.900		0.380	U	4.800		2.600		1.900	B	3.900	
BARIUM	MG/KG	97.100		0.570	B	83.600		81.800		55.700	B	115.000	
BERYLLIUM	MG/KG	0.760	B	0.200	U	0.710	B	0.580	B	0.510	B	0.920	B
CADMIUM	MG/KG	1.200	U	1.000	U	1.100	U	1.100	U	1.500	U	1.200	U
CALCIUM	MG/KG	13000.000		27.600	U	12300.000		74000.000		3170.000		19800.000	
CHROMIUM	MG/KG	26.300		2.000	U	21.400		11.600		19.000		18.800	
COBALT	MG/KG	12.000		2.000	U	10.900	B	8.800	B	9.700	B	12.100	B
COPPER	MG/KG	17.400		2.000	U	15.900		10.100		13.000		15.900	
IRON	MG/KG	21000.000		146.000		18800.000		14800.000		18000.000		22400.000	
LEAD	MG/KG	6.600		0.380	U	9.900		5.000		6.500		5.800	
MAGNESIUM	MG/KG	6900.000		8.300	B	6300.000		4280.000		5460.000		6900.000	
MANGANESE	MG/KG	315.000		0.760	B	289.000		401.000		331.000		390.000	
MERCURY	MG/KG	0.120	U	0.090	U	0.100	U	0.100	U	0.150	U	0.120	U
NICKEL	MG/KG	19.900		4.000	U	17.600		8.200	B	19.800		14.500	
POTASSIUM	MG/KG	2210.000		200.000	U	1860.000		784.000	B	1880.000		2310.000	
SELENIUM	MG/KG	0.440	UJ	0.380	UJ	0.420	UJ	0.430	UJ	0.610	U	0.490	UJ
SILVER	MG/KG	1.200	U	1.000	U	1.100	U	2.300		1.500	U	1.800	B
SODIUM	MG/KG	199.000	B	35.300	U	182.000	B	184.000	B	230.000	B	293.000	B
THALLIUM	MG/KG	0.750	BJ	0.500	B	0.860	B	1.100	BJ	0.610	U	0.490	UJ
VANADIUM	MG/KG	39.200		2.000	U	34.600		44.700		24.700		49.900	
ZINC	MG/KG	43.900		1.500	U	40.300		21.800		37.800		40.300	
TITANIUM	MG/KG	1020.000		3.900		872.000		1080.000		---		---	
CYANIDE	MG/KG	5.700	UJ	4.900	UJ	5.500	UJ	5.600	UJ	1.600	UJ	24.400	UJ

The decimal places shown do not reflect the precision reported by the laboratory

9615174.1608

	Samp#	B0BJ15		B0BJ16		B0BX94		B0BX97		B0BX98		B0BXB1	
	Date	5-17-94		6-1-94		5-31-94		6-9-94		6-9-94		6-30-94	
	Location	699-38-68A		299-W19-34B		699-38-68A		699-38-68A		699-38-68A		299-W19-34B	
	Depth	216.00 - 218.00		332.00 - 334.00		---		285.00 - 287.00		285.00 - 287.00		416.00 - 417.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments					EQUIP.BLANK				DUPLICATE			
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	10100.000		7690.000		98.400		4360.000		4850.000		6920.000	J
ANTIMONY	MG/KG	8.600	UJ	12.000	U	10.000	U	11.200	U	12.300	U	11.600	UJ
ARSENIC	MG/KG	3.700		0.480	UJ	0.400	U	0.490	B	0.490	U	0.450	U
BARIUM	MG/KG	62.700		50.300		0.990	B	40.500	B	47.200	B	61.500	
BERYLLIUM	MG/KG	0.590	B	0.580	B	0.200	U	0.230	B	0.320	B	0.260	B
CADMIUM	MG/KG	1.100	U	1.200	U	1.000	U	1.100	U	1.200	U	1.200	UJ
CALCIUM	MG/KG	50800.000		9680.000		42.800	U	2490.000		2680.000		2790.000	
CHROMIUM	MG/KG	19.600		16.200		2.200		9.400		15.500		23.700	J
COBALT	MG/KG	9.400	B	9.700	B	2.000	U	5.300	B	5.000	B	5.600	B
COPPER	MG/KG	16.300		11.300		2.000	U	9.000		11.900		3.800	BJ
IRON	MG/KG	18500.000		21000.000		177.000		8410.000		10900.000		20900.000	J
LEAD	MG/KG	7.600		6.500		1.100	U	2.200		2.400		2.700	
MAGNESIUM	MG/KG	7050.000		4630.000		14.700	B	2830.000		3340.000		4050.000	J
MANGANESE	MG/KG	251.000		310.000		1.100	U	153.000		193.000		153.000	J
MERCURY	MG/KG	0.100	U	0.120	U	0.100	U	0.110	U	0.120	U	0.120	U
NICKEL	MG/KG	19.800		16.200		4.000	U	11.300		15.000		18.400	
POTASSIUM	MG/KG	1270.000		652.000	B	200.000	U	578.000	B	644.000	B	907.000	B
SELENIUM	MG/KG	0.400	UJ	0.480	UJ	0.400	U	0.430	U	0.490	U	0.450	U
SILVER	MG/KG	1.100	U	1.200	U	1.000	U	1.100	U	1.200	U	1.200	U
SODIUM	MG/KG	243.000	B	124.000	B	20.800	B	275.000	B	281.000	B	180.000	B
THALLIUM	MG/KG	0.400	UJ	0.480	UJ	0.400	U	0.430	UJ	0.490	UJ	0.450	U
VANADIUM	MG/KG	40.800		44.800		2.000	U	15.800		23.900		47.500	
ZINC	MG/KG	42.300		27.200		2.500	B	21.100		35.000		37.100	
TITANIUM	MG/KG	---		---		---		---		---		---	
CYANIDE	MG/KG	1.100	UJ	1.200	UJ	1.000	UJ	1.100	U	1.200	U	1.200	UJ

The decimal places shown do not reflect the precision reported by the laboratory

9613174.1004

	Samp#	B0BXB4		B0BXB6		B0BXB7A		B0BXC0	
	Date	8-1-94		8-5-94		8-11-94		8-24-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B	
	Depth	440.00 - 442.00		460.00 - 462.00		480.50 - 481.50		530.00 - 531.30	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments								
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	---		10600.000	J	20000.000	J	8810.000	
ANTIMONY	MG/KG	---		12.300	U	12.500	U	11.500	UJ
ARSENIC	MG/KG	---		2.000	BJ	0.510	UJ	1.200	B
BARIUM	MG/KG	---		254.000		67.300		74.800	
BERYLLIUM	MG/KG	---		0.660	B	1.100	B	0.250	B
CADMIUM	MG/KG	---		1.200	U	1.200	U	1.100	U
CALCIUM	MG/KG	---		37700.000	J	6500.000	J	4440.000	
CHROMIUM	MG/KG	---		20.100		11.200		13.400	J
COBALT	MG/KG	---		15.200		5.100	B	5.300	B
COPPER	MG/KG	---		13.000		9.700		12.400	
IRON	MG/KG	---		25300.000	J	20600.000	J	17000.000	J
LEAD	MG/KG	---		9.700		9.300		2.700	J
MAGNESIUM	MG/KG	---		5400.000	J	9110.000	J	2880.000	
MANGANESE	MG/KG	---		1190.000	J	112.000	J	160.000	J
MERCURY	MG/KG	---		0.120	U	0.130	U	0.110	U
NICKEL	MG/KG	---		16.600		9.600	B	9.100	B
POTASSIUM	MG/KG	---		1280.000		3280.000		987.000	U
SELENIUM	MG/KG	---		0.490	UJ	0.510	U	0.460	U
SILVER	MG/KG	---		1.200	UJ	1.200	UJ	1.100	U
SODIUM	MG/KG	---		NAN		159.000	B	559.000	B
THALLIUM	MG/KG	---		0.490	UJ	0.510	U	0.460	UJ
VANADIUM	MG/KG	---		68.500		36.100		36.600	
ZINC	MG/KG	---		47.000		40.500		46.700	
TITANIUM	MG/KG	---		1130.000	J	187.000	J	1180.000	
CYANIDE	MG/KG	1.200	U	1.200	U	1.300	UJ	---	

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1409

9613474.1606

APPENDIX F

METALS VALIDATED FIELD DUPLICATE SUMMARY

FIELD DUPLICATE SAMPLES, mg/Kg						
HEIS NO.:		B0BHZ8		B0BHZ7		
DATE:		3-16-94		3-16-94		
LOCATION:		299-W19-35		299-W19-35		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
ALUMINUM	200	4370		4460		2.04
ANTIMONY	60	10.2	UJ	10.4	UJ	NC
ARSENIC	10	0.48	B	0.57	B	17.14
BARIUM	200	43.6		39	B	11.14
BERYLLIUM	5	0.34	B	0.34	B	0
CADMIUM	5	1	U	1	U	NC
CALCIUM	5000	2200		2220		0.9
CHROMIUM	10	11.2		9.6		15.38
COBALT	50	6.7	B	7.1	B	5.8
COPPER	25	9.5		9.7		2.08
IRON	100	13000		13100		0.77
LEAD	3	2.6		2.7		3.77
MAGNESIUM	5000	3190		3080		3.51
MANGANESE	15	235		214		9.35
MERCURY	0.2	0.1	U	0.08	U	NC
NICKEL	40	12.3		9.8		22.62
POTASSIUM	5000	678	B	699	B	3.05
SELENIUM	5	0.41	UJ	0.4	UJ	NC
SILVER	10	1	U	1	U	NC
SODIUM	5000	115	B	123	B	6.72
THALLIUM	10	0.41	U	0.4	U	NC
VANADIUM	50	28.8		29.8		3.41
ZINC	20	22.3		37.5		50.84
TITANIUM	3	816		809		0.86
CYANIDE	10	1	UR	1	UR	NC
NC - Not calculated						

FIELD DUPLICATE SAMPLES, mg/Kg						
HEIS NO.:		B0BJ08		B0BJ05		
DATE:		4-14-94		4-14-94		
LOCATION:		299-W19-34		299-W19-34B		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
ALUMINUM	200	8930		10200		13.28
ANTIMONY	60	11.1	U	11.5	U	NC
ARSENIC	10	4.8		3.9		20.69
BARIUM	200	83.6		97.1		14.94
BERYLLIUM	5	0.71	B	0.76	B	6.8
CADMIUM	5	1.1	U	1.2	U	NC
CALCIUM	5000	12300		13000		5.53
CHROMIUM	10	21.4		26.3		20.55
COBALT	50	10.9	U	12		200
COPPER	25	15.9		17.4		9.01
IRON	100	18800		21000		11.06
LEAD	3	9.9		6.6		40
MAGNESIUM	5000	6300		6900		9.09
MANGANESE	15	289		315		8.61
MERCURY	0.2	0.1	U	0.12	U	NC
NICKEL	40	17.6		19.9		12.27
POTASSIUM	5000	1860		2210		17.2
SELENIUM	5	0.42	UJ	0.44	UJ	NC
SILVER	10	1.1	U	1.2	U	NC
SODIUM	5000	182	B	199	B	8.92
THALLIUM	10	0.86	B	0.75	BJ	13.66
VANADIUM	50	34.6		39.2		12.47
ZINC	20	40.3		43.9		8.55
TITANIUM	3	872		1020		15.64
CYANIDE	10	5.5	UJ	5.7	UJ	NC
NC - Not calculated						

FIELD DUPLICATE SAMPLES, mg/Kg						
HEIS NO.:		B0BX98		B0BX97		
DATE:		6-9-94		6-9-94		
LOCATION:		699-38-68A		699-38-68A		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
ALUMINUM	200	4850		4360		10.64
ANTIMONY	60	12.3	U	11.2	U	NC
ARSENIC	10	0.49	U	0.49	B	200
BARIUM	200	47.2	B	40.5	B	15.28
BERYLLIUM	5	0.32	B	0.23	B	32.73
CADMIUM	5	1.2	U	1.1	U	NC
CALCIUM	5000	2680		2490		7.35
CHROMIUM	10	15.5		9.4		49
COBALT	50	5	B	5.3	B	5.83
COPPER	25	11.9		9		27.75
IRON	100	10900		8410		25.79
LEAD	3	2.4		2.2		8.7
MAGNESIUM	5000	3340		2830		16.53
MANGANESE	15	193		153		23.12
MERCURY	0.2	0.12	U	0.11	U	NC
NICKEL	40	15		11.3		28.14
POTASSIUM	5000	644	B	578	B	10.8
SELENIUM	5	0.49	U	0.43	U	NC
SILVER	10	1.2	U	1.1	U	NC
SODIUM	5000	281	B	275	B	2.16
THALLIUM	10	0.49	UJ	0.43	UJ	NC
VANADIUM	50	23.9		15.8		40.81
ZINC	20	35		21.1		49.55
CYANIDE	10	1.2	U	1.1	U	NC
NC - Not calculated						

9613474.1610

APPENDIX G

GENERAL CHEMISTRY VALIDATED DATA SUMMARY TABLES

	Samp#	BOBHZ5		BOBHZ6		BOBHZ7		BOBHZ8		BOBJ01		BOBJ02	
	Date	3-7-94		3-8-94		3-16-94		3-16-94		3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50		245.00 - 247.00		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE				EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
FLUORIDE	MG/KG	0.930	J	0.400	U	0.400	U	0.400	U	0.400	U	0.440	
CHLORIDE	MG/KG	3.600		0.700		0.400	U	0.400	U	2.900	J	3.300	J
NITRITE	MG/KG	0.400	U	0.400	U	0.400	U	0.400	U	---		---	
BROMIDE	MG/KG	1.000	U	1.000	U	1.000	U	1.000	U	---		---	
NITRATE	MG/KG	0.400	U	0.400	U	0.400	U	0.400	U	---		---	
PHOSPHATE	MG/KG	1.000	U	1.000	U	1.000	U	1.000	U	---		---	
SULFATE	MG/KG	24.000		27.000		2.900		3.400		8.600	J	1.700	J
NITRATE+NITRITE	MG-N/KG	12.000		13.000		2.500	U	2.500	U	2.500	U	2.500	U
CYANIDE	MG/KG	---		---		---		---		---		---	

The decimal places shown do not reflect the precision reported by the laboratory

9413474.1911

	Samp#	B0BJ05		B0BJ07		B0BJ08		B0BJ10		B0BJ11		B0BJ13	
	Date	4-14-94		4-14-94		4-14-94		4-18-94		4-26-94		5-9-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		699-38-68A	
	Depth	168.00 - 170.50		---		168.00 - 170.50		186.00 - 188.50		242.50 - 244.50		185.00 - 187.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP.BLANK		DUPLICATE							
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
FLUORIDE	MG/KG	0.650		1.400		0.650		0.660		0.490		0.500	
CHLORIDE	MG/KG	5.700	J	4.700	J	8.400	J	2.900	J	4.400	J	0.800	
NITRITE	MG/KG	0.400	U	0.400	U	0.400	U	0.400	U	0.400	U	0.400	U
BROMIDE	MG/KG	---		---		---		---		---		---	
NITRATE	MG/KG	59.000		0.400	U	58.000		320.000		170.000		5.000	
PHOSPHATE	MG/KG	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
SULFATE	MG/KG	22.000		1.500	U	23.000		22.000		12.000		13.000	
NITRATE+NITRITE	MG-N/KG	14.000		2.500	U	11.000		95.000		22.000		1.550	
CYANIDE	MG/KG	---		---		---		---		---		---	

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1612

	Samp#	BOBJ15		BOBJ16		BOBX94		BOBX97		BOBX98		BOBXB1	
	Date	5-17-94		6-1-94		5-31-94		6-9-94		6-9-94		6-30-94	
	Location	699-38-68A		299-W19-34B		699-38-68A		699-38-68A		699-38-68A		299-W19-34B	
	Depth	216.00 - 218.00		332.00 - 334.00		---		285.00 - 287.00		285.00 - 287.00		416.00 - 417.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments					EQUIP.BLANK				DUPLICATE			
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
FLUORIDE	MG/KG	0.900		0.400	U	0.400	U	0.400	U	0.400	U	0.400	
CHLORIDE	MG/KG	4.200		3.000		3.800		3.700		3.800		2.800	
NITRITE	MG/KG	0.400	U	0.400	UR	0.400	UR	0.400	UR	0.400	UR	0.400	U
BROMIDE	MG/KG	---		---		---		---		---		---	
NITRATE	MG/KG	18.000		1.500	J	0.500	J	14.000	J	14.000	J	0.800	
PHOSPHATE	MG/KG	1.000	U	1.000	UR	1.000	UR	1.000	UR	1.000	UR	1.000	U
SULFATE	MG/KG	37.000		4.400		2.700		8.000		7.500		3.900	
NITRATE+NITRITE	MG-N/KG	6.780		0.810		0.500	U	1.290		0.900		0.700	
CYANIDE	MG/KG	---		---		---		---		---		---	

The decimal places shown do not reflect the precision reported by the laboratory

9413474.1619

	Samp#	B0BXB4		B0BXB6		B0BXB7A	
	Date	8-1-94		8-5-94		8-11-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B	
	Depth	440.00 - 442.00		460.00 - 462.00		480.50 - 481.50	
	Type	SOIL		SOIL		SOIL	
	Comments						
Parameter	Units	Result	Q	Result	Q	Result	Q
FLUORIDE	MG/KG	0.400		0.400	U	0.600	
CHLORIDE	MG/KG	0.700		1.400		1.800	
NITRITE	MG/KG	0.400	U	0.400	U	0.400	U
BROMIDE	MG/KG	---		---		---	
NITRATE	MG/KG	0.800		0.400	U	0.400	U
PHOSPHATE	MG/KG	1.000	U	1.000	U	1.000	U
SULFATE	MG/KG	3.900		4.900		4.300	
NITRATE+NITRITE	MG-N/KG	1.000		0.500	U	1.300	
CYANIDE	MG/KG	1.000	U	---		---	

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1614

9613474.1615

APPENDIX H

GENERAL CHEMISTRY VALIDATED FIELD DUPLICATE SUMMARY

FIELD DUPLICATE SAMPLES, mg/Kg						
HEIS NO.:		B0BHZ8		B0BHZ7		
DATE:		3-16-94		3-16-94		
LOCATION:		299-W19-35		299-W19-35		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
FLUORIDE	5.0	0.4	U	0.4	U	NC
CHLORIDE	5.0	0.4	U	0.4	U	NC
NITRITE	5.0	0.4	U	0.4	U	NC
BROMIDE	5.0	1	U	1	U	NC
NITRATE	5.0	0.4	U	0.4	U	NC
PHOSPHATE	5.0	1	U	1	U	NC
SULFATE	5.0	3.4		2.9		15.87
NITRATE+NITRITE	5.0	2.5	U	2.5	U	NC
NC - Not calculated						

FIELD DUPLICATE SAMPLES, mg/Kg						
HEIS NO.:		B0BJ08		B0BJ05		
DATE:		4-14-94		4-14-94		
LOCATION:		299-W19-34B		299-W19-34B		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
FLUORIDE	5.0	0.65		0.65		0
CHLORIDE	5.0	8.4	J	5.7	J	38.3
NITRITE	5.0	0.4	U	0.4	U	NC
NITRATE	5.0	58		59		1.71
PHOSPHATE	5.0	1	U	1	U	NC
SULFATE	5.0	23		22		4.44
NITRATE+NITRITE	5.0	11		14		24
NC - Not calculated						

FIELD DUPLICATE SAMPLES, mg/Kg						
HEIS NO.:		B0BX98		B0BX97		
DATE:		6-9-94		6-9-94		
LOCATION:		699-38-68A		699-38-68A		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
FLUORIDE	5.0	0.4	U	0.4	U	NC
CHLORIDE	5.0	3.8		3.7		2.67
NITRITE	5.0	0.4	UR	0.4	UR	NC
NITRATE	5.0	14	J	14	J	0
PHOSPHATE	5.0	1	UR	1	UR	NC
SULFATE	5.0	7.5		8.0		6.45
NITRATE+NITRITE	5.0	0.9		1.29		0.36
NC - Not calculated						

9613474.1619

APPENDIX I

RADIOCHEMISTRY VALIDATED DATA SUMMARY TABLES

	Samp#	B0BHZ5		B0BHZ6		B0BHZ7		B0BHZ8		B0BJ01		B0BJ02	
	Date	3-7-94		3-8-94		3-16-94		3-16-94		3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	158.00 - 160.50		179.00 - 181.00		236.00 - 238.50		236.00 - 238.50		245.00 - 247.00		---	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments							DUPLICATE				EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.567	J	0.589	J	0.746	J	0.619	J	0.419	J	0.695	J
CURIUM-242	PCI/G	0.019		0.028	U	0.026	U	0.016	U	0.072	UJ	0.045	U
CURIUM-244	PCI/G	0.018	U	0.024	U	0.015	U	0.013	U	0.061	UJ	0.037	U
NEPTUNIUM-237	PCI/G	0.015	UJ	0.011	UJ	1.940	J	0.011	UJ	0.011	UJ	0.018	J
PLUTONIUM-238	PCI/G	0.037	U	0.021	U	0.031	U	0.021	U	0.025	U	0.025	U
PLUTONIUM-239/240	PCI/G	0.023	U	0.034	U	0.019	U	0.021	U	0.027	U	0.025	U
URANIUM-234	PCI/G	0.947	J	0.709	J	0.698	J	0.730	J	0.595		0.082	
URANIUM-235	PCI/G	0.032	U	0.039	J	0.065	J	0.043	J	0.021		0.029	U
URANIUM-238	PCI/G	1.030	J	0.836	J	0.655	J	0.803	J	0.647		0.031	
COBALT-60	PCI/G	0.021	U	0.017	U	0.015	U	0.014	U	0.014	U	0.013	U
IRON-59	PCI/G	0.070	U	0.053	U	0.048	U	0.047	U	0.054	U	0.041	U
EUROPIUM-152	PCI/G	0.099	U	0.099		0.068	U	0.094		0.094	J	0.078	U
COBALT-58	PCI/G	0.025	U	0.021	U	0.016	U	0.017	U	0.020	U	0.018	U
CESIUM-137	PCI/G	0.019	U	0.015	U	0.014		0.013	U	0.471	J	0.012	UJ
EUROPIUM-155	PCI/G	0.078		0.075		0.041		0.034	U	0.044		0.032	U
EUROPIUM-154	PCI/G	0.065	U	0.050	U	0.045	U	0.044	U	0.047	U	0.041	U
IODINE-129	PCI/G	---		---		---		---		---		---	
POTASSIUM-40	PCI/G	---		---		---		---		---		---	
MANGANESE-54	PCI/G	---		---		---		---		---		---	
RADIUM-224	PCI/G	---		---		---		---		---		---	
RADIUM-226	PCI/G	---		---		---		---		---		---	
RADIUM-228	PCI/G	---		---		---		---		---		---	
RUTHENIUM-106	PCI/G	---		---		---		---		---		---	
STRONTIUM-90	PCI/G	---		---		---		---		---		---	
THORIUM-234	PCI/G	---		---		---		---		---		---	
URANIUM-238DLP	PCI/G	---		---		---		---		---		---	
GROSS ALPHA	PCI/G	11.600		6.420		9.150		5.290		4.430		2.770	U
GROSS BETA	PCI/G	30.600		16.400		20.500		22.400		21.400		3.040	
STRONTIUM	PCI/G	0.106	UJ	0.104	UJ	0.116	UJ	0.100	UJ	0.120	UJ	0.097	UJ
TECHNETIUM-99	PCI/G	0.010	UJ	0.010	UJ	0.010	UJ	0.010	UJ	1.190	J	0.186	UJ

The decimal places shown do not reflect the precision reported by the laboratory

	Samp#	B0BJ05		B0BJ07		B0BJ08		B0BJ10		B0BJ11		B0BJ13	
	Date	4-14-94		4-14-94		4-14-94		4-18-94		4-26-94		5-9-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B		699-38-68A	
	Depth	168.00 - 170.50		---		168.00 - 170.50		186.00 - 188.50		242.50 - 244.50		185.00 - 187.00	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments			EQUIP.BLANK		DUPLICATE							
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.526	J	0.689	J	0.697	J	0.625	J	0.490	J	0.026	UJ
CURIUM-242	PCI/G	0.023	U	0.024	U	0.016	U	0.014	U	0.027	U	0.029	U
CURIUM-244	PCI/G	0.019	U	0.024	U	0.020	U	0.012	U	0.013	U	0.026	U
NEPTUNIUM-237	PCI/G	0.011	UJ	0.011	UJ	0.013	J	0.017	J	0.049	J	0.021	J
PLUTONIUM-238	PCI/G	0.030	U	0.029	U	0.023	U	0.032	U	0.017	U	0.015	U
PLUTONIUM-239/240	PCI/G	0.043	U	0.029	U	0.011	U	0.027	U	0.017	U	0.031	U
URANIUM-234	PCI/G	1.040	J	0.083	J	0.962	J	2.070	J	0.904	J	0.910	
URANIUM-235	PCI/G	0.061		0.033	U	0.042	U	0.090		0.037	U	0.060	
URANIUM-238	PCI/G	0.776	J	0.126	J	0.956	J	1.900	J	1.110	J	1.070	
COBALT-60	PCI/G	0.011	U	0.005	U	0.019	U	0.020	U	0.019	U	0.011	U
IRON-59	PCI/G	0.035	U	0.013	U	0.066	U	0.052	U	0.051	U	0.036	U
EUROPIUM-152	PCI/G	0.144		0.026	U	0.145		0.120		0.083	U	0.060	
COBALT-58	PCI/G	0.013	U	0.002		0.023	U	0.021	U	0.018	U	0.013	U
CESIUM-137	PCI/G	0.010	U	0.004	U	0.017	U	0.017	U	0.028		0.009	U
EUROPIUM-155	PCI/G	0.082		0.012	U	0.065		0.064		0.044	U	0.042	
EUROPIUM-154	PCI/G	0.036	U	0.013	U	0.068	U	0.057	U	0.056	U	0.035	U
IODINE-129	PCI/G	---		---		---		---		0.828	U	0.893	U
POTASSIUM-40	PCI/G	---		0.524		17.900		9.960		17.600		---	
MANGANESE-54	PCI/G	0.019		---		---		---		---		---	
RADIUM-224	PCI/G	1.140		0.125		1.120		0.865		0.768		---	
RADIUM-226	PCI/G	0.824		0.087		0.898		0.801		0.442		---	
RADIUM-228	PCI/G	1.190		0.101		1.160		0.808		0.769		---	
RUTHENIUM-106	PCi/G	---		---		---		---		---		0.084	U
STRONTIUM-90	PCI/G	---		---		---		---		---		0.287	J
THORIUM-234	PCI/G	6.410		---		8.390		---		---		---	
URANIUM-238DLP	PCI/G	---		---		---		---		---		---	
GROSS ALPHA	PCI/G	13.700		5.110	U	17.500		5.430	U	20.400		9.880	
GROSS BETA	PCI/G	26.100		3.670	U	28.900		18.500		32.200		25.400	
STRONTIUM	PCI/G	0.144	U	0.182		0.245		0.316		0.356		---	
TECHNETIUM-99	PCI/G	0.595		0.511	U	0.511	U	0.511	U	0.511	U	0.522	U

The decimal places shown do not reflect the precision reported by the laboratory

9613174.1621

	Samp#	B0BJ15		B0BJ16		B0BX94		B0BX97		B0BX98		B0BXB1	
	Date	5-17-94		6-1-94		5-31-94		6-9-94		6-9-94		6-30-94	
	Location	699-38-68A		299-W19-34B		699-38-68A		699-38-68A		699-38-68A		299-W19-34B	
	Depth	216.00 - 218.00		332.00 - 334.00		---		285.00 - 287.00		285.00 - 287.00		416.00 - 417.50	
	Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Comments					EQUIP.BLANK				DUPLICATE			
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.018	UJ	0.029	U	0.025	U	0.024	U	0.016	U	0.021	U
CURIUM-242	PCI/G	0.022	U	0.049	U	0.050	U	0.028	U	0.028	U	0.026	U
CURIUM-244	PCI/G	0.012	U	0.054	U	0.058	U	0.024	U	0.024	U	0.014	U
NEPTUNIUM-237	PCI/G	0.017	UJ	0.017	UJ	0.017	UJ	0.017	UJ	0.021	UJ	0.019	UJ
PLUTONIUM-238	PCI/G	0.024	U	0.064	UJ	0.018	U	0.024	U	0.016	U	0.016	U
PLUTONIUM-239/240	PCI/G	0.021		0.113	UJ	0.037	U	0.026	U	0.029	U	0.028	U
URANIUM-234	PCI/G	0.854		0.825		0.089		0.467		0.583		0.680	
URANIUM-235	PCI/G	0.035		0.081		0.029	U	0.029	U	0.037	U	0.037	U
URANIUM-238	PCI/G	0.804		0.895		0.075		0.550		0.512		0.898	
COBALT-60	PCI/G	0.012	U	0.009	U	0.004	U	0.009	U	0.009	U	0.019	U
IRON-59	PCI/G	0.032	U	0.026	U	0.012	U	0.024	U	0.023	U	0.055	U
EUROPIUM-152	PCI/G	0.086		0.094	J	0.023	U	0.092	J	0.039	U	0.038	U
COBALT-58	PCI/G	0.012	U	0.009	U	0.005	U	0.009	U	0.009	U	0.019	U
CESIUM-137	PCI/G	0.010	U	0.008	U	0.004	U	0.008	U	0.010		0.016	U
EUROPIUM-155	PCI/G	0.048		0.046		0.013		0.022	U	0.022	U	0.047	U
EUROPIUM-154	PCI/G	0.034	U	0.028	U	0.013	U	0.031	U	0.029	U	0.057	U
IODINE-129	PCI/G	0.867	U	0.904	U	0.509	U	0.796	U	0.856	U	0.911	U
POTASSIUM-40	PCI/G	---		11.200		0.511		14.900		14.300		14.100	
MANGANESE-54	PCI/G	---		0.012		---		0.011		---		---	
RADIUM-224	PCI/G	---		0.919		0.134	J	0.532		0.525		0.749	
RADIUM-226	PCI/G	---		0.562		0.093	J	0.390		0.373		0.446	
RADIUM-228	PCI/G	---		0.921		0.112	J	0.553		0.504		0.702	
RUTHENIUM-106	PCi/G	0.092	U	---		---		---		---		---	
STRONTIUM-90	PCI/G	0.372	J	0.338	UR	0.123	U	0.147	U	0.157	U	0.345	
THORIUM-234	PCI/G	---		---		---		---		---		---	
URANIUM-238DLP	PCI/G	---		0.815		0.164		0.262		0.457		0.758	
GROSS ALPHA	PCI/G	8.960		15.600		5.330	U	6.800		10.900		17.200	
GROSS BETA	PCI/G	24.000		22.100		3.660	U	17.000		22.300		28.400	
STRONTIUM	PCI/G	---		---		---		---		---		---	
TECHNETIUM-99	PCI/G	0.522	U	0.597		0.496	U	0.496	U	0.496	U	0.496	U

The decimal places shown do not reflect the precision reported by the laboratory

9613474.1622

	Samp#	B0BXB4		B0BXB6		B0BXB7A		B0BXC0	
	Date	8-1-94		8-5-94		8-11-94		8-24-94	
	Location	299-W19-34B		299-W19-34B		299-W19-34B		299-W19-34B	
	Depth	440.00 - 442.00		460.00 - 462.00		480.50 - 481.50		530.00 - 531.30	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments								
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.025	U	0.030	U	0.027	U	0.048	U
CURIUM-242	PCI/G	0.024	U	0.033	U	0.040	U	0.051	U
CURIUM-244	PCI/G	0.029	U	0.028	U	0.042	U	0.068	U
NEPTUNIUM-237	PCI/G	0.062	J	0.186	J	0.019	UJ	0.017	UJ
PLUTONIUM-238	PCI/G	0.081	U	0.025	U	0.051	U	0.015	U
PLUTONIUM-239/240	PCI/G	0.032	U	0.025	U	0.128	U	0.037	U
URANIUM-234	PCI/G	0.754		0.700		0.676		2.060	J
URANIUM-235	PCI/G	0.063	U	0.041		0.031	U	0.194	UR
URANIUM-238	PCI/G	0.718		0.644		0.776		1.780	J
COBALT-60	PCI/G	0.043	U	0.040	U	0.041	U	0.015	U
IRON-59	PCI/G	0.182	U	0.158	U	0.148	U	0.047	U
EUROPIUM-152	PCI/G	0.087	U	0.080	U	0.082	U	0.035	U
COBALT-58	PCI/G	0.059	U	0.056	U	0.056	U	0.018	U
CESIUM-137	PCI/G	0.038	U	0.038	U	0.036	U	0.014	U
EUROPIUM-155	PCI/G	0.083	U	0.076	U	0.083	U	0.058	
EUROPIUM-154	PCI/G	0.129	U	0.127	U	0.125	U	0.048	U
IODINE-129	PCI/G	0.648	U	0.664	U	0.701	U	0.584	U
POTASSIUM-40	PCI/G	17.500		---		12.400		11.000	
MANGANESE-54	PCI/G	---		---		---		---	
RADIUM-224	PCI/G	1.060		0.805		0.982		0.519	
RADIUM-226	PCI/G	0.493		0.660		0.458		0.719	
RADIUM-228	PCI/G	1.270		1.070		1.270		0.532	
RUTHENIUM-106	PCI/G	---		---		---		---	
STRONTIUM-90	PCI/G	---		---		---		0.147	U
THORIUM-234	PCI/G	---		---		---		---	
URANIUM-238DLP	PCI/G	1.190		---		0.889		0.857	
GROSS ALPHA	PCI/G	11.500		11.700		12.900		20.600	
GROSS BETA	PCI/G	26.600		21.900		20.600		23.100	
STRONTIUM	PCI/G	0.240		0.139	U	0.130	U	---	
TECHNETIUM-99	PCI/G	0.521		0.521	U	0.521	U	0.511	U

The decimal places shown do not reflect the precision reported by the laboratory

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9613474.1624

APPENDIX J

RADIOCHEMISTRY VALIDATED FIELD DUPLICATE SUMMARY

FIELD DUPLICATE SAMPLES, pCi/g						
HEIS NO.:		B0BHZ8		B0BHZ7		
DATE:		3-16-94		3-16-94		
LOCATION:		299-W19-35		299-W19-35		
COMMENTS:		DUPLICATE				
PARAMETER	CRDL	RESULT	Q	RESULT	Q	RPD
STRONTIUM		0.0996	UJ	0.116	UJ	NC
AMERICIUM-241	1.0	0.619		0.746		18.61
CURIUM-242		0.0162	U	0.026	U	NC
CURIUM-244	1.0	0.0132	U	0.0155	U	NC
NEPTUNIUM-237	1.0	0.0113	UJ	1.94	J	200
PLUTONIUM-238	1.0	0.0212	U	0.0307	U	NC
PLUTONIUM-239/240	1.0	0.0211	U	0.0192	U	NC
URANIUM-234	1.0	0.73	J	0.698	J	4.48
URANIUM-235	1.0	0.0428	J	0.0646	J	40.6
URANIUM-238	1.0	0.803	J	0.655	J	20.3
COBALT-58		0.0169	U	0.0163	U	NC
COBALT-60	0.05	0.014	U	0.0152	U	NC
CESIUM-137	0.1	0.0128	U	0.0142		200
EUROPIUM-152	0.1	0.0936		0.0678	U	200
EUROPIUM-154	0.1	0.044	U	0.0447	U	NC
EUROPIUM-155	0.1	0.0345	U	0.0405		200
IRON-59		0.0469	U	0.048	U	NC
GROSS ALPHA	10.0	5.29		9.15		53.46
GROSS BETA	15.0	22.4		20.5		8.86
TECHNETIUM-99	15.0	0.01	UJ	0.01	UJ	NC
NC - Not calculated						