9613490.0609

W0063-ITC-071 450

0000001

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

0045385

CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

RECORD COPY

June 27, 1994

Job Number: 532 & 576

This is the Certificate of Analysis for the following samples:

SDG:	W0063
Client Project ID:	WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1
Date Received by Lab:	May 13 & May 21, 1994
Number of Samples:	Three (3)
Sample Type:	Soil

I. Introduction

On May 13 and May 21, 1994, three (3) soil samples 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.

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

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

OCT 1996 RECEIVED EDMC

JUL 1994 RECEIVED SDLA

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

II. Analytical Results/Methodology (Continued)

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 volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Finnigan INCOS 500 GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

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.

The samples for work order #532 were digested on May 16, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 17, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 20 through May 31, 1994; the remaining metals were analyzed by ICP on June 7, 1994. All run QC was acceptable A duplicate and a spike were analyzed using sample BOBJ13. Spike recovery (accuracy) results were within acceptance limits for all requested parameters except for antimony by ICP and thallium by GFAA analysis. Poor spike recovery for these two analyte appeared to be attributable to matrix interferences. Duplicate RPD (precision) results were within acceptance limits for all requested parameters. The detection limit for cyanide was elevated due to matrix interference.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control

The samples for work order #576 were digested on May 24, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 27, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 24 through May 27, 1994; the remaining metals were analyzed by ICP on May 26, 1994. All run QC was acceptable. The samples were batched with QC from work order #532.

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.

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.

The samples were analyzed for fluoride, chloride, nitrite, nitrate, phosphate and sulfate on May 31 and June 13, 1994 using EPA method 300.0. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

The samples were analyzed for nitrate/nitrite on June 3, 1994. Matrix spike and a matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Test
AA8767	405245-01A	BOBJ13	VOC
AA8768	405245-01B	"	SVOC
AA8769	405245-01C	"	METALS-T
AA8770	405245-01D	"	CYANIDE
AA8771	405245-01E	"	ANIONS
AA8772	405245-01F	"	NO3NO2
AA8776	405245-02A	BOBJ14	VOC
AA9559	405443-01A	BOBJ15	VOC
AA9560	405443-01B	"	SVOC
AA9561	405443-01C	"	METAL-T
AA9562	405443-01D	"	CYANIDE
AA9563	405443-01E	"	ANIONS
AA9564	405443-01F	"	NO3NO2

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

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

DON'T SAY IT --- Write It!

DATE July 13, 1994

To W0063, samples BOBJ13 and BOBJ15

FROM Jeff Lerch H4-23
Telephone 372-2596

cc: Doris Ayres
Briana Colley
Chris Koerner
Sandy Walls

SUBJECT Carbon-14 data not reported

Due to an insufficient presence of carbon in the samples (described on page 0008 of the radiochemistry laboratory case narrative), data for C-14 will not be reported for samples BOBJ13, and BOBJ15.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8767

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8767

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 20 Date Analyzed: 05/20/94

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	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	8	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	5	J
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	Xylene (total)	12	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8767

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8767

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 20 Date Analyzed: 05/20/94

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	2.50	17	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ14

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8776

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8776

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 0 Date Analyzed: 05/20/94

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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ14

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8776

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8776

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 0 Date Analyzed: 05/20/94

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	2.50	14	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9559

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA9559R

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: not dec. 8 Date Analyzed: 05/27/94

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	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	19	B
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	11	U
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylene (total)	11	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9559

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA9559R

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: not dec. 8 Date Analyzed: 05/27/94

GC Column: DB624 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	8	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8768

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA8768

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-Di-n-Propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	1000	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	1000	U
131-11-3	Dimethylphthalate	410	U
208-96-8	Acenaphthylene	410	U
606-20-2	2,6-Dinitrotoluene	410	U
99-09-2	3-Nitroaniline	1000	U
83-32-9	Acenaphthene	410	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8768

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA8768

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1000	U
100-02-7	4-Nitrophenol	1000	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	1000	U
534-52-1	4,6-Dinitro-2-Methylphenol	1000	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	1000	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-Butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
56-55-3	Benzo(a)Anthracene	410	U
218-01-9	Chrysene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
117-84-0	Di-n-Octyl Phthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8768

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA8768

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.05	5500	BAJ
2.	UNKNOWN	8.10	260	BJ
3.	UNKNOWN	8.60	130	BAJ
4.	UNKNOWN	9.53	160	BJ
5.	UNKNOWN	17.13	360	J
6.	UNKNOWN	19.07	85	J
7.	UNKNOWN	20.42	97	BJ
8.	UNKNOWN	21.00	320	BJ
9.	UNKNOWN	22.17	92	BJ
10.	UNKNOWN	23.65	130	BJ

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9560

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9560

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: 8 decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 06/07/94

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	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	870	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	870	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	870	U
83-32-9	Acenaphthene	360	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9560

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9560

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: 8 decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 06/07/94

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	870	U
100-02-7	4-Nitrophenol	870	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	870	U
534-52-1	4,6-Dinitro-2-Methylphenol	870	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	
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.

BOBJ15

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9560

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9560

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: 8 decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 06/07/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 7

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	5.08	5800	ABJN
2.	UNKNOWN	5.72	91	AJ
3.	UNKNOWN	8.60	140	BJ
4.	UNKNOWN	13.28	94	BJ
5.	UNKNOWN PHTHALATE	16.38	120	J
6.	UNKNOWN	17.15	250	BJ
7.	UNKNOWN	21.03	260	BJ

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS_KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0532 SAS No.: SDG No.: W0063
Matrix (soil/water): SOIL Lab Sample ID: AA8769
Level (low/med): LOW Date Received: 05/13/94
% Solids: 80.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10800			P
7440-36-0	Antimony	12.5	U	N	P
7440-38-2	Arsenic	3.9			F
7440-39-3	Barium	115			P
7440-41-7	Beryllium	0.92	B		P
7440-43-9	Cadmium	1.2	U		P
7440-70-2	Calcium	19800			P
7440-47-3	Chromium	18.8			P
7440-48-4	Cobalt	12.1	B		P
7440-50-8	Copper	15.9			P
7439-89-6	Iron	22400			P
7439-92-1	Lead	5.8		S	F
7439-95-4	Magnesium	6900			P
7439-96-5	Manganese	390			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	14.5			P
7440-09-7	Potassium	2310			P
7782-49-2	Selenium	0.49	U	W	F
7440-22-4	Silver	1.8	B		P
7440-23-5	Sodium	293	B		P
7440-28-0	Thallium	0.49	U	WN	F
7440-62-2	Vanadium	49.9			P
7440-66-6	Zinc	40.3			P
5955-70-0	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0532 SAS No.: SDG No.: W0063

Matrix (soil/water): SOIL Lab Sample ID: AA8770

Level (low/med): LOW Date Received: 05/13/94

% Solids: 80.3

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
5955-70-0	Cyanide	24.4	U	N	AS

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0576 SAS No.: SDG No.: W0063

Matrix (soil/water): SOIL Lab Sample ID: AA9561

Level (low/med): LOW Date Received: 05/21/94

% Solids: 92.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10100			P
7440-36-0	Antimony	8.6	U	N	P
7440-38-2	Arsenic	3.7			F
7440-39-3	Barium	62.7			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	50800			P
7440-47-3	Chromium	19.6			P
7440-48-4	Cobalt	9.4	B		P
7440-50-8	Copper	16.3			P
7439-89-6	Iron	18500			P
7439-92-1	Lead	7.6		S	F
7439-95-4	Magnesium	7050			P
7439-96-5	Manganese	251			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	19.8			P
7440-09-7	Potassium	1270			P
7782-49-2	Selenium	0.40	U	W	F
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium	243	B		P
7440-28-0	Thallium	0.40	U	WN	F
7440-62-2	Vanadium	40.8			P
7440-66-6	Zinc	42.3			P
5955-70-0	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0576 SAS No.: SDG No.: W0063
Matrix (soil/water): SOIL Lab Sample ID: AA9562
Level (low/med): LOW Date Received: 05/21/94
% Solids: 92.0

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
5955-70-0	Cyanide	1.1	U	N	AS

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

Comments:
CYANIDE ONLY.

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	532
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg	Analysis Date:	06/03/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6280	0.50	U
BOBJ13	AA8772	1.55	+

+ - 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:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	576
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg	Analysis Date:	06/03/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6280	0.50	U
BOBJ15	AA9564	6.78	+

+ - 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:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	532
Client Sample ID:	BOBJ13	Preparation Date:	05/31/94
Lab Sample ID:	AA8771	Analysis Date:	05/31/94
Sample Matrix:	Soil	Concentration Units:	mg/kg

Compound	Result	Qualifier	Detection Limit
fluoride	0.5	+	0.4
chloride	0.8	+	0.4
nitrite	0.4	U	0.4
nitrate	5.0	+	1.2
phosphate	1.0	U	1.0
sulfate	13	+	4.5

+ - 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:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	576
Client Sample ID:	BOBJ15	Preparation Date:	06/13/94
Lab Sample ID:	AA9563	Analysis Date:	06/13/94
Sample Matrix:	Soil	Concentration Units:	mg/kg

Compound	Result	Qualifier	Detection Limit
fluoride	0.9	+	0.4
chloride	4.2	+	0.4
nitrite	0.4	U	0.4
nitrate	18	+	4.0
phosphate	1.0	U	1.0
sulfate	37	+	4.5

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

WO#532

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: 699-38-68A	SAF No.: 94-046
Ice Chest No.: EFS101	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0518-416	Bill of Lading/Air Bill No.: NONE

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE AJS 5/10/94 X AJS 5/10/94 1213

SAMPLE ANALYSIS: 405245

Sample No.	Matrix*	Date Sampled	Time Sampled	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 405245	*1 01			VOA (TRIP) 02 A	ACTIVIT SCAN			
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	G	G	G	P/G	P/G			aG	aGs			
No. of Container(s)				1	1	1	1	1	1	1	1			1	1			
Volume				125ml	500ml	500ml	250ml	250ml	125ml	1500ml	500ml		WVS 5-9-94	250/20 40ml	40ml			
01	S	5-9-94	0905	✓	✓	✓	✓	✓	✓	✓	✓							
02	S	5-9-94	0700											✓				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 5-10-94 1205	Received By: O J Simpson	Date/Time: 5-10-94 1205
Relinquished By: O J Simpson	Date/Time: 5-12-94 1000	Received By: K Sweeney L Sweeney	Date/Time: 5/12/94 1000
Relinquished By: K Sweeney L Sweeney	Date/Time: 5/12/94 1200	Received By: Karen Hattenburg	Date/Time: 5-12-94 12:00
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

LOWEST HOLDING TIME = 7DAYS

SDG W0063

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)

9613490.0635

0000021

WO#578

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: 699-	SAF No.: 94-046
Ice Chest No.: SML-549	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0544-8	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																
			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	G	G	G	P/G				aG	aGs			
			No. of Container(s)	1	1	1	1	1	1	1				1	1			
			Volume	125ml	500ml	500ml	250ml	250ml	125ml	1500ml				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				VOA (TRIP)	ACTIVIT SCAN			
		46544301		A	B	C	D	E	F	40544401								
Sample No.	Matrix*	Date Sampled	Time Sampled															
BOB515	S	5-17-94	0910	✓	✓	✓	✓	✓	✓	✓					✓			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-17-94 1155	[illegible]	5/17/94 1155
Relinquished By	Date/Time	Received By	Date/Time
[illegible] Simpson	5/20/94 0835	[illegible] Sweeney	0835 5/20/94
Relinquished By	Date/Time	Received By	Date/Time
[illegible] Sweeney	1200 5/20/94	[illegible] ITAS	1200 5/20/94
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

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)

9613490.0636

0000022

9613490.0637

0000023

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W94-C-C575-96

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical Supp	ER Field Sampling

The following items are to be shipped from [X] Contractor [ ] Vendor

Routing [X] Contractor [ ] Vendor

Shipped to
IT Analytical Services
2800 George Washington Way
Richland, WA 99352

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 lbs.	Sample #: BCBJ13, BCB3J4 Cooler ID: EFS161 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.	Sample #: Cooler ID: Polycooler with ~~groundwater samples~~ packed in wet ice and vermiculite	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 200 AREA

BEST AVAILABLE COPY

Bill of lading # NONE

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]	[illegible]	5/12/94

Location of Property (Area & Bldg.)	Contact	Phone
200-UP-1	P. H. Butcher	(509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
5-12-94	8B410 PTIJ13	NA

Originated By	Date	Authorized By	Date
P.H. Butcher	5/12/94	R. Simpson	5/12/94

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	5/12/94

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date				

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)

9613490.0638

0000024

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W94-0-0594-8

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical Supp	ER Field Sampling

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

Routing ☒ Contractor ☐ Vendor

Shipped to
IT Analytical Services
2800 George Washington Way
Richland, WA 99352

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 lbs.	Sample #: 60 PTS15 Cooler ID: ML-549 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.	~~Sample #: ITS 5/20/94 Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite~~	N/A

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

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 300 area.

BEST AVAILABLE COPY

Bill of lading # NA

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

RM Clearance for Public Release: [signature]	RM Survey No. 122536	Date 5/20/94
Location of Property (Area & Bldg.) 300 UP-1	Contact P. H. Butcher	Phone (509) 376-4388
Date Ready for Shipment 5/20/94	Cost Code to be Charged 8B410 / PTIDF	Approximate Date This Property will be Returned NA
Originated By P.H. Butcher	Date	Authorized By C.J. Simpson — Date 5/20/94
Signature and Name of Property Control	Custodian Date	Property Management Approval [signature] — Date 5/20/94

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
[signature] ITAS Date 5/20/94 1200				

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. *0001629*

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

WO# 532
RL# 672

Reference Document No. 453631
Page 1 of 1

Project Name/No. 1 SAF 94-046
Sample Team Members 2
Profit Center No. 3 4632
Project Manager 4 Van Petteyr
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 5-12-94
Lab Destination 8 Middlebrook
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13 206 4719 133

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
40524501 A	BOBJ13 / Soil	5/9 0905	aGS	125ml	Cool 4°	VOA	3°C BPB 5/13/94	
B			aG	500ml		Semi-voa		
C			G	↓		ICP, GFAA, Hg		
D			G	250ml		Cn		
E			G	↓		Anions SO_4 NO_2 NO_3 PO_4		
F			G	125ml		NO_2, NO_3		
02 A	BOBJ14 / Soil	5/9 0700	aGS	120ml		VOA		
		JH 5/12/94						

FOR LAB USE ONLY

FOR LAB USE ONLY

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 W0063

1. Relinquished by 28 (Signature/Affiliation) Heidelberg IT	Date: 5-12-94 Time: 16:00	1. Received by 28 (Signature/Affiliation) Bryan Blomquist ITAGKN	Date: 5/13/94 Time: 9:00
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

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

9613490.0639

0000025

MCA 3/15/91

INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001677*

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

WO# 5TH
RL# 733

Reference Document No. 453658
Page 1 of 1

Project Name/No. 1: SAF 94-046
Sample Team Members 2:
Profit Center No. 3: 4632
Project Manager 4: VAN PETTY
Purchase Order No. 6:
Required Report Date 11:

Samples Shipment Date 7: 5-20-94
Lab Destination 8: Middlebrook
Lab Contact 9:
Project Contact/Phone 12:
Carrier/Waybill No. 13: 206 7833 634

Bill to: 5: I.T. Richland
Report to: 10: I.T. Richland

White: To accompany samples
Yellow: Field copy

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
40544301A	BOBJ75 soil	9:10 5-17-94	G 125ml	125ml		VOA 2176	2°C BBB 5/21/94	
B			G	500ml		Semi VOA 2170	FOR LAB USE ONLY	
C			G	500ml		ICP/METALS HG		
D			G	250ml		CN 4120		
E			G	250ml		Anions 3966	FOR LAB USE ONLY	
F			G	125ml		NO2/NO3 3		
	KRA 5-20-94							

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): SDG W0063

1. Relinquished by 28 (Signature/Affiliation) Karen Rothenberg ITAS	Date: 5-20-94 Time: 16:00	1. Received by 28 (Signature/Affiliation) Kenyl Klemm, ITAS-KN	Date: 05-21-94 Time: 09:05
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

*See back of form for special instructions.

MCA 3/15/91

9613490.0640

0000026

WO#532

TENNELEC #1 SCREENING CALCULATION SPREADSHEET

Category II. JRN
12 May 94

Customer Code	Recieved Date	Time	Screening Prep Date	Time	Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
WHC			51294		512	10	14	221	240

Customer ID WHC/SOIL	pH <2 Rcvd/Relq	RESIDUE 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 / Aliqout Alpha	Beta	uCi per Sample Alpha	Beta	2 Sigma Error uCi per Sample Alpha	Beta	pCi/(Gm or L) Alpha	Beta	Category 1 Yes/No	Aliquot to Cat 1 Gm or Ltr Alpha	Beta
B0BJ13		89.5	90	950.0	14	4	23	0.34	1.38	3.4E+00	3.1E+00	1.6E-02	1.5E-02	1.9E-05	9.4E-06	1.7E+01	1.6E+01	No	5.9E+02	6.4E+03

wo#

0000027

9613490.0641

wo #576

"Yes's" are Category I.
"No" is Cat. II.
JRN 20 May 94

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Customer Code	Recieved Date	Recieved Time	Screening Prep Date	Screening Prep Time	Count Date	Mnts. Cntd	BACKGROUND Alpha	BACKGROUND Beta	BACKGROUND Mnts
WHC	5-20-94	12:00	5-20		5-20	10	13	219	240

Customer ID	pH <2	Plncht Wght	Vol. Anal.	Sample Size	SMPLE CNT DATA Hldr	Total	Counts	Net Sample Counts/Minute		DPM / Aliqout		uCi per Sample		2 Sigma Error uCi per Sample		pCi/(Gm or L)		Catagory 1	Aliquot to Cat 1 Gm or Ltr	
WHC	Rcvd/Relq	(mGrms)	mG mL	Gm L	Num.	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Yes/No	Alpha	Beta
BOBJ15		56.9	57	1100.0	11	9	29	0.85	1.99	6.49E+00	3.92E+00	5.7E-02	3.4E-02	4.5E-05	2.0E-05	5.1E+01	3.1E+01	No	1.9E+02	3.2E+03
BOBMYO		0.9	5	4.0	7	8	29	0.75	1.99	2.86E+00	3.75E+00	1.0E-03	1.3E-03	8.6E-07	7.3E-07	2.6E+02	3.4E+02	Yes	3.9E+01	3.0E+02
BOBMW8		4.3	5	4.0	8	4	164	0.35	15.49	9.29E-01	3.30E+01	3.3E-04	1.2E-02	5.9E-07	6.9E-05	8.4E+01	3.0E+03	Yes	1.2E+02	3.4E+01
BOBMWO		3.1	5	4.0	10	5	23	0.45	1.39	1.77E+00	2.67E+00	6.4E-04	9.6E-04	6.8E-07	9.1E-07	1.6E+02	2.4E+02	Yes	6.3E+01	4.2E+02
BOBMP4		4.9	5	4.0	9	3	20	0.25	1.09	9.94E-01	2.17E+00	3.6E-04	7.8E-04	5.1E-07	1.1E-06	9.0E+01	2.0E+02	Yes	1.1E+02	5.1E+02
TOTAL uCi												5.9E-02	4.9E-02							

0000028

9613190.0643196

WO #532

05/11/94 07:47 ☎373 3176 222S 3B →→→ TR 57 002

SAMPLE STATUS REPORT FOR E 5534. E-BLANK BOBJ13 TIME: 5/11/94 8:28
DISPATCHED: 3/ 8/94 10:42 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 5/10/94 14:22

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

BOBJ13
BOBJ14
WCS
5/12/94

WO #576

SAMPLE STATUS REPORT FOR E 5536. E-BLANK BOBJ15 TIME: 5/19/94 10:51
DISPATCHED: 3/ 8/94 10:43 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 5/19/94 7:46

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

BOBJ15 AJS 5/20/94

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

July 11, 1994

Attention: J.A.Lerch

SAF Number	:	94-046
Date SDG Closed	:	May 12, 1994
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0063
Data Deliverable	:	Stand Alone

I. Introduction

On May 12 and 20, 1994, two 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
405246-01A	B0BJ13	Soil	5/12/94
405444-01A	B0BJ15	Soil	5/20/94

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, the analytical result(s) 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
Iodine-129 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 W0063 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 II.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The batch was reanalyzed due to a low LCS radiochemical recovery (40%). The reanalysis also indicated a problem with the IQO spike used for the LCS. The original spike was recounted and the results duplicated the first count of the spike. The low radiochemical recovery is believed to be isolated to the LCS and the IQO spike is under investigation. The EQJN spike, also used in the Am-241 analysis, has been analyzed simultaneously with the IQO spike and has not shown any difficulties with radiochemical recoveries. The original data are accepted and reported. The batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Neptunium-237 by method ITAS-RD-3208
The batch was reanalyzed due to a suspected sample and matrix spike switch. The reanalysis data are accepted and reported. The LCS, matrix spike, batch blank, sample and sample duplicate (duplicate of sample B0BJ13 and B0BJ15) results are within contractual requirements.

Plutonium-238, 239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Uranium-234, 235, 238 by method ITAS-RD-3234
The sample duplicate result for U-235 is not within 3 sigma of the sample U-235 result. The sample duplicate data are accepted based on acceptable U-234 and U-238 agreement with the sample. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ15) results are accepted and reported.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Cd-109 was detected in samples B0BJ13, B0BJ15, and the duplicate of sample B0BJ13, however, the results are not reported because they are suspected false positive results caused by x-ray lines produced by energy reflection from the detector shielding. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Iodine-129 by method ITAS-RD-3219
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
Sample B0BJ13 and the duplicate of sample B0BJ13 were recounted because their results were outside of the 3 sigma control limit on the initial count. The recount is accepted and reported. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204
The results for sample B0BJ13 and the duplicate of sample B0BJ13 were not within the 3 sigma control limit. The results are accepted because the results are less than the contractual detection limit, and also because of the nonhomogeneous nature of the soil matrix. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are accepted and reported.

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3247
Carbon-14 results are not reportable for these samples due to an insufficient presence of 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 produced insufficient carbon dioxide during sample preparation. Two separate attempts were made to extrude carbon from the sample matrices. The sample results are considered unreportable due to a matrix effect (lack of carbon in the matrix).

Technetium-99 by method ITAS-IT-RS-0001
The matrix spike, LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

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

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

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	40524601	MATRIX:	SOIL
WHC ID:	B0BJ13	DATE RECEIVED:	5/12/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	1.94E-02	2.07E-02	2.09E-02	2.57E-02	pCi/g	80.80%	RD3302
CM-242	1.82E-02	2.22E-02	2.24E-02	2.93E-02	pCi/g	80.80%	RD3302
CM-244	9.12E-03	1.47E-02	1.48E-02	2.59E-02	pCi/g	80.80%	RD3302
NP-237	2.08E-02	1.86E-02	1.92E-02	1.13E-02	pCi/g	100.00%	RD3208
PU-238	0.00E+00	0.00E+00	1.64E-02	1.48E-02	pCi/g	76.00%	RD3209
PU239/40	3.29E-03	1.14E-02	1.14E-02	3.09E-02	pCi/g	76.00%	RD3209
U-234	9.10E-01	1.80E-01	2.27E-01	6.06E-02	pCi/g	47.20%	RD3234
U-235	6.03E-02	4.67E-02	4.76E-02	4.03E-02	pCi/g	47.20%	RD3234
U-238DA	1.07E+00	1.95E-01	2.54E-01	4.71E-02	pCi/g	47.20%	RD3234
CO-58	-4.49E-03	7.91E-03	7.92E-03	1.27E-02	pCi/g	N/A	RD3219
CO-60	2.52E-03	6.76E-03	6.76E-03	1.13E-02	pCi/g	N/A	RD3219
CS-137DA	1.12E-03	5.56E-03	5.56E-03	9.44E-03	pCi/g	N/A	RD3219
EU-152	5.96E-02	3.18E-02	3.24E-02	5.73E-02	pCi/g	N/A	RD3219
EU-154	-3.31E-02	2.19E-02	2.21E-02	3.51E-02	pCi/g	N/A	RD3219
EU-155	4.15E-02	1.71E-02	1.76E-02	2.94E-02	pCi/g	N/A	RD3219
FE-59	-6.58E-03	2.23E-02	2.23E-02	3.61E-02	pCi/g	N/A	RD3219
RU-106DA	2.39E-02	4.92E-02	4.93E-02	8.38E-02	pCi/g	N/A	RD3219
I-129LP	1.64E-01	5.05E-01	5.05E-01	8.93E-01	pCi/g	N/A	RD3219
ALPHA	9.88E+00	4.59E+00	4.71E+00	5.00E+00	pCi/g	100.00%	RD3222
BETA	2.54E+01	2.61E+00	3.11E+00	2.77E+00	pCi/g	100.00%	RD3222
STRONTIUM	2.87E-01	8.52E-02	1.09E-01	1.61E-01	pCi/g	71.90%	RD3204
TC-99	-6.53E-02	2.22E-01	1.05E+00	5.22E-01	pCi/g	100.00%	ITAS-IT-RS-0001

Number of Results: 22

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

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	40544401	MATRIX:	SOIL
WHC ID:	B0BJ15	DATE RECEIVED:	5/20/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	-3.63E-04	7.26E-04	7.28E-04	1.83E-02	pCi/g	91.70%	RD3302
CM-242	-4.36E-04	8.72E-04	8.75E-04	2.20E-02	pCi/g	91.70%	RD3302
CM-244	0.00E+00	0.00E+00	1.37E-02	1.24E-02	pCi/g	91.70%	RD3302
NP-237	-3.33E-04	6.66E-04	6.70E-04	1.67E-02	pCi/g	100.00%	RD3208
PU-238	-1.72E-03	2.43E-03	2.44E-03	2.43E-02	pCi/g	97.10%	RD3209
PU239/40	2.06E-02	1.93E-02	1.94E-02	2.05E-02	pCi/g	97.10%	RD3209
U-234	8.54E-01	1.46E-01	1.86E-01	3.68E-02	pCi/g	67.00%	RD3234
U-235	3.53E-02	3.05E-02	3.09E-02	3.32E-02	pCi/g	67.00%	RD3234
U-238DA	8.04E-01	1.42E-01	1.78E-01	3.84E-02	pCi/g	67.00%	RD3234
CO-58	-2.49E-03	7.30E-03	7.31E-03	1.17E-02	pCi/g	N/A	RD3219
CO-60	7.17E-03	6.45E-03	6.49E-03	1.16E-02	pCi/g	N/A	RD3219
CS-137DA	-2.33E-03	6.03E-03	6.03E-03	9.94E-03	pCi/g	N/A	RD3219
EU-152	8.55E-02	3.41E-02	3.52E-02	6.28E-02	pCi/g	N/A	RD3219
EU-154	8.65E-04	2.05E-02	2.05E-02	3.44E-02	pCi/g	N/A	RD3219
EU-155	4.77E-02	1.83E-02	1.89E-02	3.14E-02	pCi/g	N/A	RD3219
FE-59	-7.00E-03	2.02E-02	2.02E-02	3.25E-02	pCi/g	N/A	RD3219
RU-106DA	3.19E-02	5.46E-02	5.46E-02	9.19E-02	pCi/g	N/A	RD3219
I-129LP	1.21E-01	4.91E-01	4.91E-01	8.67E-01	pCi/g	N/A	RD3219
ALPHA	8.96E+00	4.40E+00	4.51E+00	4.99E+00	pCi/g	100.00%	RD3222
BETA	2.40E+01	2.52E+00	2.98E+00	2.61E+00	pCi/g	100.00%	RD3222
STRONTIUM	3.72E-01	7.66E-02	1.26E-01	1.32E-01	pCi/g	100.00%	RD3204
TC-99	-3.58E-01	2.17E-01	1.03E+00	5.22E-01	pCi/g	100.00%	ITAS-IT-RS-0001

Number of Results: 22

9613490.0652

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 5-12-94 12:00 Client Name WHC

Project/Client # SAF 94-046 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) EFS10N

1. Condition of shipping container? O.K.
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: X tape ____ hazard labels
   X custody seals ____ appropriate sample labels
9. Samples are: X 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) N/A
    Request for analysis #(s) N/A
    Airbill # N/A Carrier N/A
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☒

Printed Name/Signature Karen Fichtenberg ITAS Date/Time 5-12-94 12:00

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

0049

6/24/94

*** AM/CMISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401	ES J10740	WHC	B0DJ15	cat II

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 6/2/94 Bm

3) SAMPLE REMAINDER STORED _____

RD 3221 6/9/94 Bm

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED mmh 6-30-94

Am 6/24/94 JMH

6/16/94

*** AM/CMISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP WG063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524613	ESJ10737			
	L0524615	IG0026			
1)	40524601	ESJ10738	WHC	BOBJ13	cath
	F0524601	10739			cath

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 6/2/94

3) SAMPLE REMAINDER STORED
RD3221 6/6/94

4) SEPARATION LAB RECEIVED

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED 6-30-94

Am 6/24/94 JMH

9613490.0655

6/16/94

*** NP-237 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W00C63

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524613				
	L0524615	E0R085			
1)	40524601		WHC	B0BJ13	
	F0524601				

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 6/2/94 BM

3) SAMPLE REMAINDER STORED _____
RD3221

4) SEPARATION LAB RECEIVED 6-10-94

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED MMA 7-454

0062

6/24/94

*** NP-237 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401		WHC	B0DJ15	
	W0544401 EQR086				
	W0544410 EQR087				

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 6/2/94 Bom

3) SAMPLE REMAINDER STORED _____
RD3221

4) SEPARATION LAB RECEIVED 6-20-94 Susie

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED MMK 7-4-94

0063

6/16/94

*** PUISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER S-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524601B	ESH16571			
	L0524601S	IQHI056			
1)	40524601	ESH16572	WHC	B0BJ13	Cat II
	F0524601	16573			Cat II

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 6/2/94 Btm

3) SAMPLE REMAINDER STORED _____
RD3221 6/6/94 Btm

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

Pw 6/24/94 JWH

6/24/94

*** PUISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401	ESH 16574	WHC	BOBJ15	Cont II

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 6/2/94 BM

3) SAMPLE REMAINDER STORED _____
RD3221 6/6/94 BM

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND
ANALYTICAL PREP STORED _____

Pu 6/24/94 JMH

0037

6/16/94

*** UISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524618 ESI16040				
	L0524615 ESIE065				
1)	40524601 ESI16041		WHC	R0BJ13	

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 6/2/94 Bm

3) SAMPLE REMAINDER STORED _____
RD 3221

4) SEPARATION LAB RECEIVED 6/6/94 Ew

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED mmm 6-13-94

6/24/94

*** [illegible] ***

CHAIN OF CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

ITAG ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
A0544401	ESI 16043	WHC	80DJ15	
F0544401	16042			

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 6/2/94 [illegible]

3) SAMPLE REMAINDER STORED _____
RD3221

4) SEPARATION LAB RECEIVED 6/6/94 [illegible]

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED [illegible] 6-13-94

9613490.0661

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Gamma MATRIX Soil DUE DATE 6/16/94

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L05246 ~~18~~ 6-2-94	-1B	WHC	QC BATCH REAGENT BLANK CAL 827
L	-1X		QC BATCH MATRIX BLANK
L05246	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE CAL 816
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 05246 01	-		Duplicate of Sample # 405 24601
405 24601	- N/A		
405 44401	- N/A		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by JN on 6-2-94 Rec'd in C.R. by SK on 6-2-94

Rec'd in Prep Lab by 5-31-94 JN on 5-31-94 Data Reviewed and anal. Prep stored SCE on 7/6/94

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

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

6/16/94

*** GAMMA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	✓ L0524610		Blank	CAL 827	
	✓ L0524615		Spike	CAL 816	
1)	✓ 40524601		WHC	BOBJ13	
	✓ F0524601	DUP			

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 5/31/94 gN

3) SAMPLE REMAINDER STORED 6-2-94 gN

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

0072

9613490.0663

6/24/94

*** GAMMA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER S-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401		WHC	BOBJ15	

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 5-31-94 JN

3) SAMPLE REMAINDER STORED 6-7-94 JN

4) SEPARATION LAB RECEIVED

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

*** I-129LP ***

6/16/94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W00063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524613		Blank		
	L0524615		EQZK014		
1)	40524601		WHC	B0BJ13	
	E0524601	DUP			

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 5-31-94 JN

3) SAMPLE REMAINDER STORED 6-2-94 JN

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613490.0665

6/24/94

*** I-129LP ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401		WHC	BOBJ15	

ACTIONS (Initial & Date)

1) INITIATED (B) 5/20/94

2) PREP LAB RECEIVED 5-31-94 JN

3) SAMPLE REMAINDER STORED 6-2-94 JN

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

6/16/94

*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	~~L0524601 IB~~		Blank		
	L0524615		Spike	EQEG230	10.010 ± .092801
1)	40524601		WHC	B0BJ13	
	~~F0524601~~	Duplicate		~~EQEG230~~ MK 6-7-94	

ACTIONS (Initial & Date)

INITIATED 5/13/94

PREP LAB RECEIVED 5-31-94 gN

SAMPLE REMAINDER STORED 6-2-94 gN

SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED MK 6-8-94

6/24/94

*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1	40544401		WHC	B0BJ15	

ACTIONS (Initial & Date)

INITIATED (S) 5/20/94

PREP LAB RECEIVED 5-31-94 JN

SAMPLE REMAINDER STORED 6-2-94 JN

SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED AK 6-8-94

6/16/94

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524613		Blank		
	L0524615		Spike	EQBA043	25.068 ± .35365
1)	40524601		WHC	BOBJ13	
	F0524601		Duplicate		

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 5-31-94 gN

3) SAMPLE REMAINDER STORED 6-2-94 gN

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613490.0669

6/24/94

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401		WHC	BOBJ15	

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 5-31-94 JN

3) SAMPLE REMAINDER STORED 6-2-94 JN

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

0082

6/16/94

*** TOTAL-IR ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD 13-May-1994
Page 1

CUSTOMER: WHC SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL BATCH NUMBER 5-246

	ITAS ID	SUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0524613				
	L0524615				
1)	40524601		WHC	R0BJ13	
	F0524601				

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 6.1.94

3) SAMPLE REMAINDER STORED N/A

4) SEPARATION LAB RECEIVED

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

0084

6/24/94

*** TOTAL CR ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: UHC

SAMPLE DELIVERY GROUP W00063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	SUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40E44401		UHC	80DJ15	

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 6/9/94

3) SAMPLE REMAINDER STORED

4) SEPARATION LAB RECEIVED

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

0085

6/24/94

*** C 14 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401		WHC	BOBJ15	

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED 6-22-94 DM

3) SAMPLE REMAINDER STORED 6-30-94 DM

4) SEPARATION LAB RECEIVED 6-22-94 DM

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

6/16/94

*** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

13-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-246

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40524601		WHC	B0BJ13	

ACTIONS (Initial & Date)

1) INITIATED 5/13/94

2) PREP LAB RECEIVED 6/02/94 MM

3) SAMPLE REMAINDER STORED 6/07/94 MM

4) SEPARATION LAB RECEIVED 6/02/94 MM

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

6/24/99

*** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

20-May-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0063

MATRIX : SOIL

BATCH NUMBER 5-444

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40544401		WHC	BOBJ15	

ACTIONS (Initial & Date)

1) INITIATED 5/20/94

2) PREP LAB RECEIVED _____

3) SAMPLE REMAINDER STORED _____

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB_____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613490.0675

DON'T SAY IT - - WRITE IT!

Date: 12-15-94

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 complettion 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

9613490.0676

RECORD COPY

MEMORANDUM

RECEIVED Validation Log In

TO: 200-UP-1 Project QA Record

November 10, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE W0063-ITC-071 (943-1610.035,071voa.UP1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0063-ITC-071 prepared by the International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BJ13*	5/9/94	SOIL	SEE NOTE 1
B0BJ15	5/17/94	SOIL	

Note 1: The samples were analyzed for volatile target compound list (TCL) organics using EPA CLP methods.
* - Indicates sample results which were 100% recalculated.

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 to this memo 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.

9613490.0677

RECORD COPY

MEMORANDUM

TO: 200-UP-1 Project QA Record

November 28, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE W0063-ITC-071 (943-1610.033,071voa.UP1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0063-ITC-071 prepared by the International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BJ13*	5/9/94	SOIL	SEE NOTE 1
B0BJ14	5/9/94	SOIL	
B0BJ15	5/17/94	SOIL	
W0063TP	NA	WATER	

Note 1: The samples were analyzed for volatile target compound list (TCL) organics using EPA CLP methods.
* - Indicates sample results which were 100% recalculated.

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 to this memo 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.

Revised 11/28/94

Completeness. The data package was complete for all requested analyses. Four samples (4) were validated in this data set with a total of 132 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

Minor deficiencies were identified during validation which required qualification of data.

Holding Time

- No chain of custody was available for the sample identified as TRIPBLANK. All results reported for the sample have been qualified as estimated (UJ) since holding times could not be verified.

Continuing Calibration

- The percent difference (%D) for bromoform and vinyl chloride were outside control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Blanks

- Methylene chloride and acetone were detected in the laboratory blank. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

FIELD QUALITY CONTROL

- Samples B0BJ14 and TRIPBLANK were identified as trip blanks. 2-Butanone and tentatively identified compounds were detected in the trip blanks. No qualification was applied in accordance with validation procedures.

TENTATIVELY IDENTIFIED COMPOUNDS

Tentatively identified compounds (TICs) were evaluated during validation and qualified as follows:

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

9613490.0679

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.

9613490.0680

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.

9615499.8082

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0063-ITC-071	REVIEWER: S. Schildt	DATE: 11/8/94	PAGE 1 OF 1
COMMENTS: Volatiles			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
All	J/UJ	TRIPBLANK	Holding time undetermined due to no COC available
Bromoform	Not necessary due to previous qualification	TRIPBLANK	%D > control limits
Vinyl Chloride	UJ	B0BJ13, B0BJ14	%D > control limits
Acetone	U	B0BJ15,TRIPBLANK	Compound detected in the laboratory blank
Methylene Chloride	U	B0BJ13, B0BJ14, B0BJ15 TRIPBLANK	Compound detected in the laboratory blank

9613490.0684

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0063-ITC-071

	Samp#	B0BJ13		B0BJ14		B0BJ15		W0063TP	
	Date	5-9-94		5-9-94		5-17-94		---	
	Location	699-38-68A		699-38-68A		699-38-68A		699-38-68A	
	Depth	185.00 - 187.00		---		216.00 - 218.00		---	
	Type	SOIL		---		SOIL		---	
	Comments			TRIP BLK				TRIP BLK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
BROMOMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
VINYL CHLORIDE	UG/KG	12.000	UJ	10.000	UJ	11.000	U	10.000	UJ
CHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
METHYLENE CHLORIDE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
ACETONE	UG/KG	8.000	J	10.000	U	19.000	U	10.000	UJ
CARBON DISULFIDE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,1-DICHLOROETHENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,1-DICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,2-DICHLOROETHENE (TOTAL)	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
CHLOROFORM	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,2-DICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
2-BUTANONE	UG/KG	12.000	U	10.000	U	11.000	U	3.000	J
1,1,1-TRICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
CARBON TETRACHLORIDE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
BROMODICHLOROMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,2-DICHLOROPROPANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
CIS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
TRICHLOROETHENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
DIBROMOCHLOROMETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,1,2-TRICHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
BENZENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
TRANS-1,3-DICHLOROPROPENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
BROMOFORM	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
4-METHYL-2-PENTANONE	UG/KG	5.000	J	10.000	U	11.000	U	10.000	UJ
2-HEXANONE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
TETRACHLOROETHENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
1,1,2,2-TETRACHLOROETHANE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
TOLUENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
CHLOROBENZENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
ETHYLBENZENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
STYRENE	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ
XYLENES (TOTAL)	UG/KG	12.000	U	10.000	U	11.000	U	10.000	UJ

The decimal places shown do not reflect the precision reported by the laboratory

Received 11/29/94

009

9613490.0686

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ13
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8767

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8767

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 20 Date Analyzed: 05/20/94

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	Q
74-87-3	Chloromethane	12	U	
74-83-9	Bromomethane	12	U	
75-01-4	Vinyl Chloride	12	~~U~~	UJ
75-00-3	Chloroethane	12	U	
75-09-2	Methylene Chloride	12 ~~103~~	~~BJ~~	U
67-64-1	Acetone	8	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~~	UJ
108-10-1	4-Methyl-2-Pentanone	5	J	
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	Xylene (total)	12	U	

Reviewed

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8767

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8767

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 20 Date Analyzed: 05/20/94

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	2.50	17	~~J~~

Q

JN

FORM I VOA-TIC

3/90

011 11/10/94

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ14
699-38-68A
Trip blank

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8776

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8776

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 0 Date Analyzed: 05/20/94

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	Q
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	~~U~~	U5
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	~~10.2~~	~~BJ~~	U
67-64-1	Acetone	10	U	
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	~~U~~	U5 11/8/9
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ14

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8776

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA8776

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. 0 Date Analyzed: 05/20/94

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	Q
1.	UNKNOWN	2.50	14	~~J~~	JN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ15
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9559

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA9559R

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: not dec. 8 Date Analyzed: 05/27/94

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	11	U	
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	11 ~~103~~	~~BJ~~	u
67-64-1	Acetone	19 ~~19~~	~~B~~	u
75-15-0	Carbon Disulfide	11	U	
75-35-4	1,1-Dichloroethene	11	U	
75-34-3	1,1-Dichloroethane	11	U	
540-59-0	1,2-Dichloroethene (total)	11	U	
67-66-3	Chloroform	11	U	
107-06-2	1,2-Dichloroethane	11	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	11	U	
56-23-5	Carbon Tetrachloride	11	U	
75-27-4	Bromodichloromethane	11	U	
78-87-5	1,2-Dichloropropane	11	U	
10061-01-5	cis-1,3-Dichloropropene	11	U	
79-01-6	Trichloroethene	11	U	
124-48-1	Dibromochloromethane	11	U	
79-00-5	1,1,2-Trichloroethane	11	U	
71-43-2	Benzene	11	U	
10061-02-6	trans-1,3-Dichloropropene	11	U	
75-25-2	Bromoform	11	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	11	U	
79-34-5	1,1,2,2-Tetrachloroethane	11	U	
108-88-3	Toluene	11	U	
108-90-7	Chlorobenzene	11	U	
100-41-4	Ethylbenzene	11	U	
100-42-5	Styrene	11	U	
1330-20-7	Xylene (total)	11	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9559

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA9559R

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: not dec. 8 Date Analyzed: 05/27/94

GC Column: DB624 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	8	J

Q
JN

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

W0063TP
TRIPBLANK

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) WATER Lab Sample ID: AA8777

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AA8777

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. ____ Date Analyzed: 05/18/94

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	Q
74-87-3	Chloromethane	10	U	UJ
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~~ 12	~~BJ~~	UJ
67-64-1	Acetone	~~10~~ 16	~~BJ~~	UJ
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	3	J	J
71-55-6	1,1,1-Trichloroethane	10	U	UJ
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	

11/10/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIPBLANK

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) WATER Lab Sample ID: AA8777

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AA8777

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: not dec. ____ Date Analyzed: 05/18/94

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

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

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9613490.0694

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9613490.0695

0000001

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

RECORD COPY

June 27, 1994

Job Number: 532 & 576

This is the Certificate of Analysis for the following samples:

SDG:	W0063
Client Project ID:	WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1
Date Received by Lab:	May 13 & May 21, 1994
Number of Samples:	Three (3)
Sample Type:	Soil

I. Introduction

On May 13 and May 21, 1994, three (3) soil samples 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.

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

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

JUL 1994
RECEIVED
SDLA

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

IT Analytical Services, 5815 Middlebrook Pike, Knoxville, TN 37921

681-1-89

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

II. Analytical Results/Methodology (Continued)

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 volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Finnigan INCOS 500 GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

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.

The samples for work order #532 were digested on May 16, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 17, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 20 through May 31, 1994; the remaining metals were analyzed by ICP on June 7, 1994. All run QC was acceptable A duplicate and a spike were analyzed using sample BOBJ13. Spike recovery (accuracy) results were within acceptance limits for all requested parameters except for antimony by ICP and thallium by GFAA analysis. Poor spike recovery for these two analyte appeared to be attributable to matrix interferences. Duplicate RPD (precision) results were within acceptance limits for all requested parameters. The detection limit for cyanide was elevated due to matrix interference.

11/8/94

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control

The samples for work order #576 were digested on May 24, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 27, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 24 through May 27, 1994; the remaining metals were analyzed by ICP on May 26, 1994. All run QC was acceptable. The samples were batched with QC from work order #532.

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.

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.

The samples were analyzed for fluoride, chloride, nitrite, nitrate, phosphate and sulfate on May 31 and June 13, 1994 using EPA method 300.0. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

The samples were analyzed for nitrate/nitrite on June 3, 1994. Matrix spike and a matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

11/8/94

021

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Test
AA8767	405245-01A	BOBJ13	VOC
AA8768	405245-01B	"	SVOC
AA8769	405245-01C	"	METALS-T
AA8770	405245-01D	"	CYANIDE
AA8771	405245-01E	"	ANIONS
AA8772	405245-01F	"	NO3NO2
AA8776	405245-02A	BOBJ14	VOC
AA9559	405443-01A	BOBJ15	VOC
AA9560	405443-01B	"	SVOC
AA9561	405443-01C	"	METAL-T
AA9562	405443-01D	"	CYANIDE
AA9563	405443-01E	"	ANIONS
AA9564	405443-01F	"	NO3NO2

11/8/94

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

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

11/8/94

WO#532

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: 699-38-68A	SAF No.: 94-046
Ice Chest No.: EFS101	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0518-46	Bill of Lading/Air Bill No.: NONE

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE ~~3D~~ 3C AJS 5/10/94 12D

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	G	G	G	P/G	P/G			aG	aGs				
No. of Container(s)	1	1	1	1	1	1	1	1			1	1				
Volume	125ml	500ml	500ml	250ml	250ml	125ml	1500ml	500ml		WVS 5-9-94	~~250~~/20 ~~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)	ACTIVIT SCAN				
405245	A	B	C	D	E	F	40524601				02 A					

Sample No.	Matrix*	Date Sampled	Time Sampled														
B0BJ13 01	S	5-9-94	0905	✓	✓	✓	✓	✓	✓	✓	✓						
B0BJ14 02	S	5-9-94	0700											✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W.V. Setzer	5-10-94 1205	O.J. Simpson	5-10-94 1205
O.J. Simpson	5-12-94 1000	K. Sweeney L. Sweeney	5/12/94 1000
K. Sweeney L. Sweeney	5/12/94 1200	Karen Hattenberg	5-12-94 12:00

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

LOWEST HOLDING TIME = 7DAYS

SDG W0063

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)

RPD 11/2/94

024

9613490.0700

0000021

W0#578

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: 699-	SAF No.: 94-046
Ice Chest No.: SML-549	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0594-8	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			
Type of Container			aGs	aG	G	G	G	G	P/G				aG	aGs			
No. of Container(s)			1	1	1	1	1	1	1				1	1			
Volume			125ml	500ml	500ml	250ml	250ml	125ml	1500ml				40ml	40ml			
SAMPLE ANALYSIS 46544301			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 40544401				VOA (TRIP)	ACTIVIT SCAN			
Sample No.	Matrix*	Date Sampled	Time Sampled														
BOBJ15	S	5-17-94	0910	✓	✓	✓	✓	✓	✓	✓				✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-17-94 1155	A J Simpson	5/17/94 1155
A J Simpson	5/20/94 0835	L Sweeney L Sweeney	0835 5/20/94
L Sweeney L Sweeney	1200 5/20/94	ITAS	1200 5/20/94

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

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)

025

11/2/94

9613490.0701

0000022

9613490.0702

0000006

CUR #1629

Work Order No.: 532

Condition Upon Receipt Variance Report

ITAS - KNOXVILLE Laboratory

Client: Westinghouse Hanford

Date: 5/13/94

Project No: SAF 94-046

Initiated by: Bryan Blomquist

Analysis Requested: VOA - Trip Blank

RFA/COC Numbers: 453631

Client Sample Numbers Affected: Trip Blank.

Condition/Variance (Check all that apply):

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☑ Sample received without proper paperwork. Explain: Trip Blank not Listed on RFA/COC.
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☑ Sample ID on container does not match sample ID on paperwork. Explain: BDBJ14; RFA/COC = 40524502-A, BPB ~~should~~ Label shows it as 40524501-F.
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Bryan Blomquist Date: 5/16/94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

026 5/8/94

96149012705

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9613490.0704

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		DATA PACKAGE: W0063-ITC-071
VALIDATOR: S. Schildt	LAB: ~~Q~~ IT	DATE: 11/2/94
CASE: ~~W0063~~ 532, 576		SDG: W0063

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 BOBJ13, 14, 15, TRIPBLANK / 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: Chain of custody missing for TRIPBLANK, results qualified J/UJ.

028

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . (Yes) No N/A 11/23/94

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

Are continuing calibrations acceptable? . . . . . Yes (No) N/A OK

Comments: ~~%RSD >20.5 for bromoform in init. cal. for BOBJ13,~~ Bromoform and vinyl chloride %D >25% in cont. cal. ~~for BOBJ13, 14 & Tripblank~~. Associated results qualified J, UJ. 11/8/94

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: Methylene chloride and acetone detected in lab. blanks. associated results qualified U. 2-butanone detected in TRIPBLANK

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:

Reviewed 11/23/94

029

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments:

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

Comments:

9613490.0707

HOLDING TIME SUMMARY

SDG: W0063-ITC-071 | VALIDATOR: S. Schildt | DATE: 11/2/94 | PAGE 1 OF 1

COMMENTS: Volatiles

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBJ13	VOA	5/9/94	NA	5/20/94	NA	11	none
BOBJ14	↓	5/9/94	↓	5/20/94	↓	11	↓
BOBJ15	↓	5/17/94	↓	5/27/94	↓	10	↓
TRIPBLANK	VOA	—	NA	5/18/94	NA	—	J

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Instrument ID: I500A Calibration date: 05/17/94 Time: 1616

Lab File ID: WS0517 Init. Calib. Date(s): 05/16/94 05/16/94

Heated Purge: (Y/N) N Init. Calib. Times: 1013 1407

GC Column: DB-624 ID: 0.530(mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.671	0.561		16.4	
Bromomethane	1.600	1.281	0.100	19.9	25.0
Vinyl Chloride	0.806	0.697	0.100	13.5	25.0
Chloroethane	0.964	0.717		25.6	
Methylene Chloride	1.276	1.250		2.0	
Acetone	0.183	0.170		7.1	
Carbon Disulfide	2.579	2.035		21.1	
1,1-Dichloroethene	1.138	1.084	0.100	4.7	25.0
1,1-Dichloroethane	2.122	2.171	0.200	-2.3	25.0
1,2-Dichloroethene (total)	1.382	1.370		0.9	
Chloroform	2.925	2.941	0.200	-0.5	25.0
1,2-Dichloroethane	1.156	1.185	0.100	-2.5	25.0
2-Butanone	0.393	0.324		17.6	
1,1,1-Trichloroethane	0.745	0.625	0.100	16.1	25.0
Carbon Tetrachloride	0.675	0.523	0.100	22.5	25.0
Bromodichloromethane	0.448	0.391	0.200	12.7	25.0
1,2-Dichloropropane	0.351	0.324		7.7	
cis-1,3-Dichloropropene	0.379	0.346	0.200	8.7	25.0
Trichloroethene	0.505	0.454	0.300	10.1	25.0
Dibromochloromethane	0.432	0.353	0.100	18.3	25.0
1,1,2-Trichloroethane	0.344	0.289	0.100	16.0	25.0
Benzene	1.051	0.954	0.500	9.2	25.0
trans-1,3-Dichloropropene	0.273	0.238	0.100	12.8	25.0
Bromoform	0.313	0.225	0.100	28.1	25.0
4-Methyl-2-Pentanone	0.278	0.207		25.5	
2-Hexanone	0.175	0.121		30.9	
Tetrachloroethene	0.534	0.498	0.200	6.7	25.0
1,1,2,2-Tetrachloroethane	0.506	0.393	0.500	22.3	25.0
Toluene	1.196	1.083	0.400	9.4	25.0
Chlorobenzene	1.024	0.924	0.500	9.8	25.0
Ethylbenzene	0.449	0.408	0.100	9.1	25.0
Styrene	0.933	0.842	0.300	9.8	25.0
Xylene (total)	0.559	0.509	0.300	8.9	25.0
Toluene-d8	1.017	0.985		3.1	
4-Bromofluorobenzene	0.700	0.666	0.200	4.9	25.0
1,2-Dichloroethane-d4	0.984	1.001		-1.7	

All other compounds must meet a minimum RRF of 0.010.

11/8/94

FORM VII VOA 3/90

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Instrument ID: I500A Calibration date: 05/20/94 Time: 0841

Lab File ID: WS0520 Init. Calib. Date(s): 05/18/94 05/18/94

Heated Purge: (Y/N) Y Init. Calib. Times: 1124 1624

GC Column: DB-624 ID: 0.530(mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.972	0.703		27.7	
Bromomethane	1.653	1.357	0.100	17.9	25.0
Vinyl Chloride	1.104	0.816	0.100	26.1	25.0
Chloroethane	1.168	0.898		23.1	
Methylene Chloride	1.767	1.587		10.2	
Acetone	0.393	0.300		23.7	
Carbon Disulfide	3.177	2.420		23.8	
1,1-Dichloroethene	1.374	1.227	0.100	10.7	25.0
1,1-Dichloroethane	3.017	2.901	0.200	3.8	25.0
1,2-Dichloroethene (total)	1.653	1.535		7.1	
Chloroform	3.530	3.436	0.200	2.7	25.0
1,2-Dichloroethane	2.204	2.149	0.100	2.5	25.0
2-Butanone	0.840	0.661		21.3	
1,1,1-Trichloroethane	0.536	0.577	0.100	-7.6	25.0
Carbon Tetrachloride	0.462	0.478	0.100	-3.5	25.0
Bromodichloromethane	0.407	0.440	0.200	-8.1	25.0
1,2-Dichloropropane	0.374	0.399		-6.7	
cis-1,3-Dichloropropene	0.372	0.400	0.200	-7.5	25.0
Trichloroethene	0.417	0.456	0.300	-9.4	25.0
Dibromochloromethane	0.361	0.387	0.100	-7.2	25.0
1,1,2-Trichloroethane	0.324	0.354	0.100	-9.3	25.0
Benzene	1.163	1.288	0.500	-10.8	25.0
trans-1,3-Dichloropropene	0.281	0.287	0.100	-2.1	25.0
Bromoform	0.255	0.254	0.100	0.4	25.0
4-Methyl-2-Pentanone	0.488	0.351		28.1	
2-Hexanone	0.309	0.217		29.8	
Tetrachloroethene	0.502	0.429	0.200	14.5	25.0
1,1,2,2-Tetrachloroethane	0.727	0.556	0.500	23.5	25.0
Toluene	1.300	1.110	0.400	14.6	25.0
Chlorobenzene	1.057	0.925	0.500	12.5	25.0
Ethylbenzene	0.471	0.414	0.100	12.1	25.0
Styrene	0.972	0.824	0.300	15.2	25.0
Xylene (total)	0.585	0.507	0.300	13.3	25.0
Toluene-d8	1.107	0.941		15.0	
4-Bromofluorobenzene	0.802	0.736	0.200	8.2	25.0
1,2-Dichloroethane-d4	1.776	1.700		4.3	

All other compounds must meet a minimum RRF of 0.010.

11/8/94

9613490.0710

~~0000018~~

Trip blank

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAA9228

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) WATER Lab Sample ID: AA9228

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: WB05172

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

% Moisture: not dec. ____ Date Analyzed: 05/17/94

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	2	J	x10=20
67-64-1	Acetone	4	J	x10=40
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)	1	J	

FORM I VOA

11/8/94 3/90

9613490.0711

0000020

BOBJ13,14

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAA9504

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9504

Sample wt/vol: 5.0 (g/mL) G Lab File ID: WB0520

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

% Moisture: not dec. ____ Date Analyzed: 05/20/94

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

x10=40

FORM I VOA 11/8/94 3/90

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~~0000022~~

BOBJ15

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAB0038

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AB0038

Sample wt/vol: 5.0 (g/mL) G Lab File ID: WB05272

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

% Moisture: not dec. ____ Date Analyzed: 05/27/94

GC Column: DB624 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	2	J	x10=20
67-64-1	Acetone	5	J	x10=52
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	

FORM I VOA 3/90

11/15/94

036

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RECORD COPY

MEMORANDUM

NOV DEC 11 '94
OCT 1994
RECEIVED
Validation
Log In

TO: 200-UP-1 Project QA Record

November 10, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: SEMIVOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE W0063-ITC-071 (943-1610.035,071svoa.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0063-ITC-071 prepared by International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BJ13* B0BJ15	5/9/94 5/17/94	SOIL SOIL	SEE NOTE 1

Note 1: The samples were analyzed for semivolatile target compound list (TCL) organics using EPA CLP methods.
* - Indicates sample results which were 100% recalculated.

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 to this memo 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. Two samples (2) were validated in this data set with a total of 128 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Continuing Calibration

- The percent difference (%D) for chrysene was greater than control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) were evaluated during validation and qualified as follows:

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).
- TICs were detected in the samples and associated laboratory blanks 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 identified as common laboratory contaminant, 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 were identified as common laboratory contaminant, resulting in qualification of the results as unusable (UR) as shown in attachment 3.

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

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0063-ITC-071	REVIEWER: S. Schildt	DATE: 11/8/94	PAGE 1 OF 1
COMMENTS: Semivolatiles			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Chrysene	UJ	B0BJ15	%D in continuing calibration > 25%

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0063-ITC-071

	Samp#	BOBJ13		BOBJ15	
	Date	5-9-94		5-17-94	
	Location	699-38-68A		699-38-68A	
	Depth	185.00 - 187.00		216.00 - 218.00	
	Type	SOIL		SOIL	
	Comments				
Parameter	Units	Result	Q	Result	Q
PHENOL	UG/KG	410.000	U	360.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	410.000	U	360.000	U
2-CHLOROPHENOL	UG/KG	410.000	U	360.000	U
1,3-DICHLOROBENZENE	UG/KG	410.000	U	360.000	U
1,4-DICHLOROBENZENE	UG/KG	410.000	U	360.000	U
1,2-DICHLOROBENZENE	UG/KG	410.000	U	360.000	U
2-METHYLPHENOL	UG/KG	410.000	U	360.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	410.000	U	360.000	U
4-METHYLPHENOL	UG/KG	410.000	U	360.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	410.000	U	360.000	U
HEXACHLOROETHANE	UG/KG	410.000	U	360.000	U
NITROBENZENE	UG/KG	410.000	U	360.000	U
ISOPHORONE	UG/KG	410.000	U	360.000	U
2-NITROPHENOL	UG/KG	410.000	U	360.000	U
2,4-DIMETHYLPHENOL	UG/KG	410.000	U	360.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	410.000	U	360.000	U
2,4-DICHLOROPHENOL	UG/KG	410.000	U	360.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	410.000	U	360.000	U
NAPHTHALENE	UG/KG	410.000	U	360.000	U
4-CHLOROANILINE	UG/KG	410.000	U	360.000	U
HEXACHLOROBUTADIENE	UG/KG	410.000	U	360.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	410.000	U	360.000	U
2-METHYLNAPHTHALENE	UG/KG	410.000	U	360.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	410.000	U	360.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	410.000	U	360.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	1000.000	U	870.000	U
2-CHLORONAPHTHALENE	UG/KG	410.000	U	360.000	U
2-NITROANILINE	UG/KG	1000.000	U	870.000	U
DIMETHYLPHTHALATE	UG/KG	410.000	U	360.000	U
ACENAPHTHYLENE	UG/KG	410.000	U	360.000	U
2,6-DINITROTOLUENE	UG/KG	410.000	U	360.000	U
3-NITROANILINE	UG/KG	1000.000	U	870.000	U
ACENAPHTHENE	UG/KG	410.000	U	360.000	U
2,4-DINITROPHENOL	UG/KG	1000.000	U	870.000	U
4-NITROPHENOL	UG/KG	1000.000	U	870.000	U
DIBENZOFURAN	UG/KG	410.000	U	360.000	U

The decimal places shown do not reflect the precision reported by the laboratory

Verified 11/9/94

009

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Validated Data Summary, Data Package: W0063-ITC-071

	Samp#	B0BJ13		B0BJ15	
	Date	5-9-94		5-17-94	
	Location	699-38-68A		699-38-68A	
	Depth	185.00 - 187.00		216.00 - 218.00	
	Type	SOIL		SOIL	
	Comments				
Parameter	Units	Result	Q	Result	Q
2,4-DINITROTOLUENE	UG/KG	410.000	U	360.000	U
DIETHYLPHTHALATE	UG/KG	410.000	U	360.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	410.000	U	360.000	U
FLUORENE	UG/KG	410.000	U	360.000	U
4-NITROANILINE	UG/KG	1000.000	U	870.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1000.000	U	870.000	U
N-NITROSODIPHENYLAMINE	UG/KG	410.000	U	360.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	410.000	U	360.000	U
HEXACHLOROBENZENE	UG/KG	410.000	U	360.000	U
PENTACHLOROPHENOL	UG/KG	1000.000	U	880.000	
PHENANTHRENE	UG/KG	410.000	U	360.000	U
ANTHRACENE	UG/KG	410.000	U	360.000	U
CARBAZOLE	UG/KG	410.000	U	360.000	U
DI-N-BUTYLPHTHALATE	UG/KG	410.000	U	360.000	U
FLUORANTHENE	UG/KG	410.000	U	360.000	U
PYRENE	UG/KG	410.000	U	360.000	U
BUTYLBENZYLPHTHALATE	UG/KG	410.000	U	360.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	410.000	U	360.000	U
BENZO(A)ANTHRACENE	UG/KG	410.000	U	360.000	U
CHRYSENE	UG/KG	410.000	U	360.000	UJ
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	410.000	U	360.000	U
DI-N-OCTYLPHTHALATE	UG/KG	410.000	U	360.000	U
BENZO(B)FLUORANTHENE	UG/KG	410.000	U	360.000	U
BENZO(K)FLUORANTHENE	UG/KG	410.000	U	360.000	U
BENZO(A)PYRENE	UG/KG	410.000	U	360.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	410.000	U	360.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	410.000	U	360.000	U
BENZO(G,H,I)PERYLENE	UG/KG	410.000	U	360.000	U

The decimal places shown do not reflect the precision reported by the laboratory

Verified 11/9/94

010

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ13
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8768

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA8768

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
106-44-5	4-Methylphenol	410	~~U~~ UJ
621-64-7	N-Nitroso-Di-n-Propylamine	410	~~U~~ UJ
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	1000	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	1000	U
131-11-3	Dimethylphthalate	410	U
208-96-8	Acenaphthylene	410	U
606-20-2	2,6-Dinitrotoluene	410	U
99-09-2	3-Nitroaniline	1000	U
83-32-9	Acenaphthene	410	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ13
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8768

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA8768

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1000	U
100-02-7	4-Nitrophenol	1000	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	1000	U
534-52-1	4,6-Dinitro-2-Methylphenol	1000	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	1000	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-Butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
56-55-3	Benzo(a)Anthracene	410	U
218-01-9	Chrysene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
117-84-0	Di-n-Octyl Phthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ13
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA8768

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA8768

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1.	UNKNOWN	5.05	5500	~~BAJ~~	UJN
2.	UNKNOWN	8.10	260	~~BJ~~	UJN
3.	UNKNOWN	8.60	130	~~BAJ~~	UJN
4.	UNKNOWN	9.53	160	~~BJ~~	UJN
5.	UNKNOWN	17.13	360	~~J~~	JN
6.	UNKNOWN	19.07	85	~~J~~	JN
7.	UNKNOWN	20.42	97	~~BJ~~	UJN
8.	UNKNOWN	21.00	320	~~BJ~~	UJN
9.	UNKNOWN	22.17	92	~~BJ~~	UJN
10.	UNKNOWN	23.65	130	~~BJ~~	UJN

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ15
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9560

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9560

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: 8 decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 06/07/94

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	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	870	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	870	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	870	U
83-32-9	Acenaphthene	360	U

Q

U ~~U~~ U ~~U~~ 11/8/

FORM I SV-1 3/90

11/10/94

014

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ15
699-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9560

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9560

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: 8 decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 06/07/94

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	870	U
100-02-7	4-Nitrophenol	870	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	870	U
534-52-1	4,6-Dinitro-2-Methylphenol	870	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	
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~~ UJ
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.

BOBJ15
099-38-68A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9560

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9560

Level: (low/med) LOW Date Received: 05/21/94

% Moisture: 8 decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 06/07/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 7

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	Q
1. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	5.08	5800	~~ABJN~~	~~UJK~~
2.	UNKNOWN	5.72	91	~~AJ~~	JN
3.	UNKNOWN	8.60	140	~~BJ~~	UJN
4.	UNKNOWN	13.28	94	~~BJ~~	UJN
5.	UNKNOWN PHTHALATE	16.38	120	~~J~~	~~JN~~
6.	UNKNOWN	17.15	250	~~BJ~~	UJN
7.	UNKNOWN	21.03	260	~~BJ~~	UJN

9613490.0729

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9613490.0730

0000001

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

RECORD COPY

June 27, 1994

Job Number: 532 & 576

This is the Certificate of Analysis for the following samples:

SDG:	W0063
Client Project ID:	WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1
Date Received by Lab:	May 13 & May 21, 1994
Number of Samples:	Three (3)
Sample Type:	Soil

I. Introduction

On May 13 and May 21, 1994, three (3) soil samples 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.

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

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

JUL 1994
RECEIVED
SDLA

11/8/94

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

018

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

II. Analytical Results/Methodology (Continued)

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 volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Finnigan INCOS 500 GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

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.

The samples for work order #532 were digested on May 16, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 17, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 20 through May 31, 1994; the remaining metals were analyzed by ICP on June 7, 1994. All run QC was acceptable A duplicate and a spike were analyzed using sample BOBJ13. Spike recovery (accuracy) results were within acceptance limits for all requested parameters except for antimony by ICP and thallium by GFAA analysis. Poor spike recovery for these two analyte appeared to be attributable to matrix interferences. Duplicate RPD (precision) results were within acceptance limits for all requested parameters. The detection limit for cyanide was elevated due to matrix interference.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control

The samples for work order #576 were digested on May 24, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 27, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 24 through May 27, 1994; the remaining metals were analyzed by ICP on May 26, 1994. All run QC was acceptable. The samples were batched with QC from work order #532.

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.

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.

The samples were analyzed for fluoride, chloride, nitrite, nitrate, phosphate and sulfate on May 31 and June 13, 1994 using EPA method 300.0. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

The samples were analyzed for nitrate/nitrite on June 3, 1994. Matrix spike and a matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Test
AA8767	405245-01A	BOBJ13	VOC
AA8768	405245-01B	"	SVOC
AA8769	405245-01C	"	METALS-T
AA8770	405245-01D	"	CYANIDE
AA8771	405245-01E	"	ANIONS
AA8772	405245-01F	"	NO3NO2
AA8776	405245-02A	BOBJ14	VOC
AA9559	405443-01A	BOBJ15	VOC
AA9560	405443-01B	"	SVOC
AA9561	405443-01C	"	METAL-T
AA9562	405443-01D	"	CYANIDE
AA9563	405443-01E	"	ANIONS
AA9564	405443-01F	"	NO3NO2

11/8/94

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

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

SAS 11/8/94

WO#532

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: 699-38-68A	SAF No.: 94-046
Ice Chest No.: EFS101	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0518-416	Bill of Lading/Air Bill No.: NONE
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE 12V		

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	G	G	G	P/G	P/G			aG	aGs			
No. of Container(s)	1	1	1	1	1	1	1	1			1	1			
Volume	125ml	500ml	500ml	250ml	250ml	125ml	1500ml	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)	ACTIVIT SCAN			
405245	A	B	C	D	E	F	405246	01			02 A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BOBJ13 01	S	5-9-94	0905	✓	✓	✓	✓	✓	✓	✓	✓						
BOBJ14 02	S	5-9-94	0700									✓					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 5-10-94 1205	Received By: O.J. Simpson	Date/Time: 5-10-94 1205
Relinquished By: O.J. Simpson	Date/Time: 5-12-94 1000	Received By: K. Sweeney / K. Sweeney	Date/Time: 5/12/94 1000
Relinquished By: K. Sweeney / K. Sweeney	Date/Time: 5/12/94 1200	Received By: Karen Hettinling	Date/Time: 5-12-94 12:00
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

LOWEST HOLDING TIME = 7DAYS

SDG W0063

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)

11/2/94

023

9613490.0735

0000021

W#578

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: 699-	SAF No.: 94-046
Ice Chest No.: SML-549	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0594-8	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			
Type of Container			aGs	aG	G	G	G	G	P/G				aG	aGs			
No. of Container(s)			1	1	1	1	1	1	1				1	1			
Volume			125ml	500ml	500ml	250ml	250ml	125ml	1500ml				40ml	40ml			
SAMPLE ANALYSIS 46544301			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 40544401				VOA (TRIP)	ACTIVIT SCAN			
Sample No.	Matrix*	Date Sampled	Time Sampled														
BOBJ15	S	5-17-94	0910	✓	✓	✓	✓	✓	✓	✓				✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-17-94 1155	A Simpson	5/20/94 1155
A Simpson	5/20/94 0835	L Sweeney L Sweeney	0835 5/20/94
L Sweeney L Sweeney	1200 5/20/94	ITAS	1200 5/20/94

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

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 11/2/94

9613490.0736

0000022

9613490.0737

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: W0063-IRC-071	
VALIDATOR: L Schildt	LAB: IT		DATE: 11/2/94
CASE: 532,576		SDG: W0063	

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 BOBJ13, BOBJ15 / 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:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

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

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

Comments: ~~4-methylphenol + N-nitroso-di-n-propylamine %RSD or X > 20.5 in init cal. Associated results qualified UJ.~~ Chrysene %D > 25% in 6/7 cont. cal. associated results qualified UJ.

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: TICs detected in blanks, associated sample TICs qualified UJN, UR.

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:

Revised 11/28/94

027

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments:

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

Comments:

HOLDING TIME SUMMARY

SDG: W0063 VALIDATOR: A. Schulodt DATE: 11/2/94 PAGE 1 OF 1

COMMENTS: Semivolatiles

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BJ13	BNA	5/9/94	5/16/94	5/26/94	7	10	none
B0BJ15	BNA	5/11/94	5/26/94	6/7/94	9	12	none

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKAA9109A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 532 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9109

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9109R

Level: (low/med) LOW Date Received: 05/13/94

% Moisture: _____ decanted: (Y/N) N Date Extracted: 05/16/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/26/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.05	4600	AJ
2.	UNKNOWN	8.10	150	J
3.	UNKNOWN	8.60	90	AJ
4.	UNKNOWN	9.53	100	J
5.	UNKNOWN	20.42	140	J
6.	UNKNOWN	20.98	170	J
7.	UNKNOWN	22.17	110	J
8.	UNKNOWN	22.87	77	J
9.	UNKNOWN	23.65	140	J

11/8/94

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKAA9895A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Matrix: (soil/water) SOIL Lab Sample ID: AA9895

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA9895

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

% Moisture: _____ decanted: (Y/N) N Date Extracted: 05/26/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 05/27/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 6

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	5.10	5200	~~AJN~~
2.	UNKNOWN	5.77	75	J
3.	UNKNOWN	8.58	120	J
4.	UNKNOWN	13.23	69	J
5.	UNKNOWN	17.10	150	J
6.	UNKNOWN	20.97	160	J

11/2/9

11/8/94

7C
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 576 SAS No.: _____ SDG No.: W0063

Instrument ID: FINN Calibration date: 06/07/94 Time: 1229

Lab File ID: CC0607 Init. Calib. Date(s): 05/26/94 05/26/94

Init. Calib. Times: 1059 1326

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Diethylphthalate	1.437	1.560		-8.6	
4-Chlorophenyl-phenylether	0.551	0.583	0.400	-5.8	25.0
Fluorene	1.104	1.251	0.900	-13.3	25.0
4-Nitroaniline	0.196	0.172		12.2	
4,6-Dinitro-2-Methylphenol	0.161	0.147		8.7	
N-Nitrosodiphenylamine (1)	0.506	0.496		2.0	
4-Bromophenyl-phenylether	0.220	0.217	0.100	1.4	25.0
Hexachlorobenzene	0.234	0.230	0.100	1.7	25.0
Pentachlorophenol	0.151	0.152	0.050	-0.7	25.0
Phenanthrene	1.084	1.184	0.700	-9.2	25.0
Anthracene	1.029	1.161	0.700	-12.8	25.0
Carbazole	0.861	0.975		-13.2	
Di-n-Butylphthalate	1.713	1.989		-16.1	
Fluoranthene	1.116	1.354	0.600	-21.3	25.0
Pyrene	1.420	1.872	0.600	-31.8	25.0
Butylbenzylphthalate	0.989	1.301		-31.6	
3,3'-Dichlorobenzidine	0.398	0.420		-5.5	
Benzo(a)Anthracene	1.144	1.263	0.800	-10.4	25.0
Chrysene	1.003	1.263	0.700	-25.9	25.0
bis(2-Ethylhexyl)Phthalate	1.267	1.524		-20.3	
Di-n-Octyl Phthalate	1.854	2.336		-26.0	
Benzo(b)Fluoranthene	1.178	1.176	0.700	0.2	25.0
Benzo(k)Fluoranthene	1.094	1.316	0.700	-20.3	25.0
Benzo(a)Pyrene	0.984	1.047	0.700	-6.4	25.0
Indeno(1,2,3-cd)Pyrene	0.975	0.911	0.500	6.6	25.0
Dibenz(a,h)Anthracene	0.789	0.689	0.400	12.7	25.0
Benzo(g,h,i)Perylene	0.847	0.805	0.500	5.0	25.0
Nitrobenzene-d5	0.554	0.559	0.200	-0.9	25.0
2-Fluorobiphenyl	1.150	1.231	0.700	-7.0	25.0
Terphenyl-d14	0.938	1.110	0.500	-18.3	25.0
Phenol-d5	2.578	2.479	0.800	3.8	25.0
2-Fluorophenol	2.524	2.264	0.600	10.3	25.0
2,4,6-Tribromophenol	0.113	0.098		13.3	
2-Chlorophenol-d4	1.519	1.685	0.800	-10.9	25.0
1,2-Dichlorobenzene-d4	0.906	0.905	0.400	0.1	25.0

(1) Cannot be separated from Diphenylamine
All other compounds must meet a minimum RRF of 0.010.

11/8/94

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OCT 1994
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Validation
Log In

MEMORANDUM

TO: 200-UP-1 Project QA Record

November 10, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE W0063-ITC-071 (943-1610.035,071ino.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0063-ITC-071 prepared by International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BJ13* B0BJ15	5/9/94 5/17/94	SOIL SOIL	SEE NOTE 1

Note 1: The samples were analyzed for target analyte list (TAL) metals and cyanide.
* - Indicates sample results which were 100% recalculated.

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 to this memo 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 with the exception of minor deficiencies 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. Two samples (2) were validated in this data set with a total of 48 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Spike Samples

- Spike sample recovery of antimony, thallium and cyanide were outside control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Analytical Spikes

- The analytical spike recovery of selenium and thallium were outside control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

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.

Reviewed 11/28/94

9613490.0747

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

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0063-ITC-071	REVIEWER: S. Schildt	DATE: 11/8/94	PAGE 1 OF 1
COMMENTS: Metals			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Thallium Cyanide	UJ	B0BJ13, B0BJ15	Sample spike recovery <75%
Selenium	UJ	B0BJ13, B0BJ15	Analytical spike recovery <85%
Thallium	UJ	B0BJ13, B0BJ15	Analytical spike recovery

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0063-ITC-071

	Samp#	B0BJ13		B0BJ15	
	Date	5-9-94		5-17-94	
	Location	699-38-68A		699-38-68A	
	Depth	185.00 - 187.00		216.00 - 218.00	
	Type	SOIL		SOIL	
	Comments				
Parameter	Units	Result	Q	Result	Q
ALUMINUM	MG/KG	10800.000		10100.000	
ANTIMONY	MG/KG	12.500	UJ	8.600	UJ
ARSENIC	MG/KG	3.900		3.700	
BARIUM	MG/KG	115.000		62.700	
BERYLLIUM	MG/KG	0.920	B	0.590	B
CADMIUM	MG/KG	1.200	U	1.100	U
CALCIUM	MG/KG	19800.000		50800.000	
CHROMIUM	MG/KG	18.800		19.600	
COBALT	MG/KG	12.100	B	9.400	B
COPPER	MG/KG	15.900		16.300	
IRON	MG/KG	22400.000		18500.000	
LEAD	MG/KG	5.800		7.600	
MAGNESIUM	MG/KG	6900.000		7050.000	
MANGANESE	MG/KG	390.000		251.000	
MERCURY	MG/KG	0.120	U	0.100	U
NICKEL	MG/KG	14.500		19.800	
POTASSIUM	MG/KG	2310.000		1270.000	
SELENIUM	MG/KG	0.490	UJ	0.400	UJ
SILVER	MG/KG	1.800	B	1.100	U
SODIUM	MG/KG	293.000	B	243.000	B
THALLIUM	MG/KG	0.490	UJ	0.400	UJ
VANADIUM	MG/KG	49.900		40.800	
ZINC	MG/KG	40.300		42.300	
CYANIDE	MG/KG	24.400	UJ	1.100	UJ

The decimal places shown do not reflect the precision reported by the laboratory

11/6/94

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0576 SAS No.: SDG No.: W0063

Matrix (soil/water): SOIL Lab Sample ID: AA9561

Level (low/med): LOW Date Received: 05/21/94

% Solids: 92.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	10100			P	
7440-36-0	Antimony	8.6	~~U~~	N	P	UJ
7440-38-2	Arsenic	3.7			F	
7440-39-3	Barium	62.7			P	
7440-41-7	Beryllium	0.59	B		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	50800			P	
7440-47-3	Chromium	19.6			P	
7440-48-4	Cobalt	9.4	B		P	
7440-50-8	Copper	16.3			P	
7439-89-6	Iron	18500			P	
7439-92-1	Lead	7.6		S	F	
7439-95-4	Magnesium	7050			P	
7439-96-5	Manganese	251			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	19.8			P	
7440-09-7	Potassium	1270			P	
7782-49-2	Selenium	0.40	~~U~~	W	F	UJ
7440-22-4	Silver	1.1	U		P	
7440-23-5	Sodium	243	B		P	
7440-28-0	Thallium	0.40	~~U~~	WN	F	UJ
7440-62-2	Vanadium	40.8			P	
7440-66-6	Zinc	42.3			P	
5955-70-0	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ15

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0576 SAS No.: SDG No.: W0063

Matrix (soil/water): SOIL Lab Sample ID: AA9562

Level (low/med): LOW Date Received: 05/21/94

% Solids: 92.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
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	
5955-70-0	Cyanide	1.1	U	N	AS	UJ

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

CYANIDE_ONLY.

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0532 SAS No.: SDG No.: W0063
Matrix (soil/water): SOIL Lab Sample ID: AA8769
Level (low/med): LOW Date Received: 05/13/94
% Solids: 80.3

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	10800			P	8 11/13/94
7440-36-0	Antimony	12.5	U	N	P	UJ
7440-38-2	Arsenic	3.9			F	
7440-39-3	Barium	115			P	
7440-41-7	Beryllium	0.92	B		P	
7440-43-9	Cadmium	1.2	U		P	
7440-70-2	Calcium	19800			P	
7440-47-3	Chromium	18.8			P	
7440-48-4	Cobalt	12.1	B		P	
7440-50-8	Copper	15.9			P	
7439-89-6	Iron	22400			P	
7439-92-1	Lead	5.8		S	F	
7439-95-4	Magnesium	6900			P	
7439-96-5	Manganese	390			P	
7439-97-6	Mercury	0.12	U		CV	
7440-02-0	Nickel	14.5			P	
7440-09-7	Potassium	2310			P	
7782-49-2	Selenium	0.49	U	W	F	UJ
7440-22-4	Silver	1.8	B		P	
7440-23-5	Sodium	293	B		P	
7440-28-0	Thallium	0.49	U	WN	F	UJ
7440-62-2	Vanadium	49.9			P	
7440-66-6	Zinc	40.3			P	
5955-70-0	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0532 SAS No.: SDG No.: W0063

Matrix (soil/water): SOIL Lab Sample ID: AA8770

Level (low/med): LOW Date Received: 05/13/94

% Solids: 80.3

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	
5955-70-0	Cyanide	24.4	U	N	AS	US

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

RECORD COPY

June 27, 1994

Job Number: 532 & 576

This is the Certificate of Analysis for the following samples:

SDG:	W0063
Client Project ID:	WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1
Date Received by Lab:	May 13 & May 21, 1994
Number of Samples:	Three (3)
Sample Type:	Soil

I. Introduction

On May 13 and May 21, 1994, three (3) soil samples 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.

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

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

JUL 1994
RECEIVED
SDLA

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

11/8/94

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

II. Analytical Results/Methodology (Continued)

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 volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Finnigan INCOS 500 GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

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.

The samples for work order #532 were digested on May 16, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 17, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 20 through May 31, 1994; the remaining metals were analyzed by ICP on June 7, 1994. All run QC was acceptable A duplicate and a spike were analyzed using sample BOBJ13. Spike recovery (accuracy) results were within acceptance limits for all requested parameters except for antimony by ICP and thallium by GFAA analysis. Poor spike recovery for these two analyte appeared to be attributable to matrix interferences. Duplicate RPD (precision) results were within acceptance limits for all requested parameters. The detection limit for cyanide was elevated due to matrix interference.

11/8/94 015

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control

The samples for work order #576 were digested on May 24, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 27, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 24 through May 27, 1994; the remaining metals were analyzed by ICP on May 26, 1994. All run QC was acceptable. The samples were batched with QC from work order #532.

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.

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.

The samples were analyzed for fluoride, chloride, nitrite, nitrate, phosphate and sulfate on May 31 and June 13, 1994 using EPA method 300.0. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

The samples were analyzed for nitrate/nitrite on June 3, 1994. Matrix spike and a matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable. 11/8/94 016

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Test
AA8767	405245-01A	BOBJ13	VOC
AA8768	405245-01B	"	SVOC
AA8769	405245-01C	"	METALS-T
AA8770	405245-01D	"	CYANIDE
AA8771	405245-01E	"	ANIONS
AA8772	405245-01F	"	NO3NO2
AA8776	405245-02A	BOBJ14	VOC
AA9559	405443-01A	BOBJ15	VOC
AA9560	405443-01B	"	SVOC
AA9561	405443-01C	"	METAL-T
AA9562	405443-01D	"	CYANIDE
AA9563	405443-01E	"	ANIONS
AA9564	405443-01F	"	NO3NO2

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

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

11/8/94

WO#532

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: 699-38-68A	SAF No.: 94-046
Ice Chest No.: EFS101	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0518-416	Bill of Lading/Air Bill No.: NONE
Possible Sample Hazards/Remarks: NONE OBSERVED	Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE 30 X A35 5/10/94 12 V	

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA (CLP) A	SEMIVOA (CLP) B	ICP MTL GFAA METALS Hg (CLP) C	Cn (CLP) D	ANIONS (C-F,CL SO4,NO2 NO3,PO4) E	NO2,NO3 EPA(353.2) F	*1 405245	*1 405246			VOA (TRIP) 02 A	ACTIVIT SCAN			
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	G	G	G	P/G	P/G			aG	aGs			
No. of Container(s)				1	1	1	1	1	1	1	1			1	1			
Volume				125ml	500ml	500ml	250ml	250ml	125ml	1500ml	500ml		WVS 5-9-94	250/120 40ml	40ml			
BOBJ13 01	S	5-9-94	0905	✓	✓	✓	✓	✓	✓	✓	✓							
BOBJ14 02	S	5-9-94	0700											✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-10-94 1205	O J Simpson	5-10-94 1205
O J Simpson	5-12-94 1000	T Sweeney	5/12/94 1000
T Sweeney	5/12/94 1200	Karen Hattenburg	5-12-94 12:00

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

LOWEST HOLDING TIME = 7DAYS

SDG W00063

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)

11/2/94

019

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0000021

WO#570

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: 699-	SAF No.: 94-046
Ice Chest No.: SML-549	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0594-8	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			
Type of Container			aGs	aG	G	G	G	G	P/G				aG	aGs			
No. of Container(s)			1	1	1	1	1	1	1				1	1			
Volume			125ml	500ml	500ml	250ml	250ml	125ml	1500ml				40ml	40ml			
SAMPLE ANALYSIS 46544301			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 405444d				VOA (TRIP)	ACTIVIT SCAN			
Sample No.	Matrix*	Date Sampled	Time Sampled														
BOBJ15	S	5-17-94	0910	✓	✓	✓	✓	✓	✓	✓				✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-17-94 1155	A Simpson	5/20/94 1155
A Simpson	5/20/94 0835	L Sweeney L Sweeney	0835 5/20/94
L Sweeney L Sweeney	1200 5/20/94	ITAS	1200 5/20/94

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

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)

020 11/2/94

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		DATA PACKAGE: W0063-ITC-071	
VALIDATOR: S. Schulte	LAB: IT	DATE: 11/3/94	
CASE: W0532		SDG: W0063	

ANALYSES PERFORMED

☑ CLP/ICP	☑ CLP/GFAA	☑ CLP/Hg	☑ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX BOBJ13/soil
BOBJ15

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments:

022

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: Init. cal. for Pb on summary form indicates 64.7% while raw data indicates within range of 90-110%. Recovery should be 104%, no qualifications. CCVs were within limits.

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A

Are ICB and CCB results acceptable? . . . . . Yes No N/A

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

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

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

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

Comments:

5. ACCURACY

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

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

Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A

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

11/3/94 Comments: Sb, ~~Al~~, CN, and Tl recoveries <75% in spike. Associated results qualified $/UJ. 11/3/94

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:

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: Analytical spike recovery of Fe and Tl <85%. Associated results qualified UJ in BOBJ13 + BOBJ15.

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:

024

HOLDING TIME SUMMARY

SDG: W0063-ITC-071 | VALIDATOR: S. Schildt | DATE: 11/3/94 | PAGE 1 OF 1

COMMENTS: Inorganics

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BJ13	ICP	5/9/94	5/16/94	6/7/94	7	29	none
	GFAA-As			5/23/94		14	
	GFAA-Pb			5/31/94		22	
	GFAA-SE			5/20/94		11	
	GFAA-Tl			5/20/94		11	
	CV-Hg		5/17/94	5/17/94	8	8	
	CN		5/18/94	5/20/94	9	11	
B0BJ15	ICP	5/17/94	5/24/94	5/26/94	7	9	none
	GFAA-As			5/24/94		7	
	GFAA-Pb			5/27/94		7	
	GFAA-Se			5/26/94		9	
	GFAA-Tl			5/25/94		8	
	CV-Hg		5/27/94	5/27/94	10	10	
	CN		5/26/94	5/27/94	9	10	

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2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO532 SAS No.: _____ SDG No.: W0063_

Initial Calibration Source: SPEX_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	20000.0	19879.28	99.4	40000.0	40313.29	100.8	40674.23	101.7	P
Antimony	2000.0	2023.32	101.2	4000.0	4157.32	103.9	4221.58	105.5	P
Arsenic	25.0	26.81	107.2	40.0	42.00	105.0	41.13	102.8	F
Barium	2000.0	1923.47	96.2	4000.0	3944.03	98.6	3968.78	99.2	P
Beryllium	2000.0	1949.67	97.5	4000.0	3989.24	99.7	4050.54	101.3	P
Cadmium	2000.0	2024.95	101.2	4000.0	4138.78	103.5	4171.50	104.3	P
Calcium	20000.0	20868.34	104.3	40000.0	42538.18	106.3	43579.11	108.9	P
Chromium	2000.0	1974.95	98.7	4000.0	4034.68	100.9	4088.97	102.2	P
Cobalt	2000.0	1995.92	99.8	4000.0	4135.91	103.4	4192.77	104.8	P
Copper	2000.0	1942.76	97.1	4000.0	4033.16	100.8	4060.18	101.5	P
Iron	20000.0	19747.82	98.7	40000.0	39863.67	99.7	40454.95	101.1	P
Lead	40.0	25.88	~~64.7~~ 104.0	40.0	39.62	99.0	38.38	96.0	F
Magnesium	20000.0	19550.25	97.8	40000.0	39637.84	99.1	40098.43	100.2	P
Manganese	2000.0	1988.94	99.4	4000.0	4144.61	103.6	4197.74	104.9	P
Mercury	4.0	4.16	104.0	4.0	4.26	106.5	4.16	104.0	CV
Nickel	2000.0	2022.51	101.1	4000.0	4230.75	105.8	4286.62	107.2	P
Potassium	20000.0	19657.64	98.3	40000.0	40208.49	100.5	40723.89	101.8	P
Selenium	25.0	27.15	108.6	40.0	41.61	104.0	41.60	104.0	F
Silver	500.0	491.76	98.4	1000.0	1021.27	102.1	1025.95	102.6	P
Sodium	20000.0	19294.00	96.5	40000.0	39353.00	98.4	39514.00	98.8	P
Thallium	25.0	23.76	95.0	40.0	38.43	96.1	37.43	93.6	F
Vanadium	2000.0	1974.90	98.7	4000.0	4122.86	103.1	4166.32	104.2	P
Zinc	2000.0	1905.13	95.3	4000.0	3894.84	97.4	3944.20	98.6	P
Cyanide	200.0	216.00	108.0	200.0	206.00	103.0	182.00	91.0	AS

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN ILM02.1

11/5/94

Blank Corrected Pk Area (A-s): 0.084
Concentration (ug/L): 25.81

Mean Conc (ug/L): 25.88 ✓ SD: 0.101 RSD(%): 0.39

QC sample is within range 22.38 - 27.62

Pb ID: ICB Seq. No.: 00009 A/S Pos.: 0 Date: 05/31/94

Replicate 1 Time: 10:22
Peak Area (A-s): 0.008 Peak Height (A): 0.014
Background Pk Area (A-s): 0.054 Background Pk Height (A): 0.035
Blank Corrected Pk Area (A-s): 0.001
Concentration (ug/L): 0.28

Replicate 2 (Peak Stored) Time: 10:24
Peak Area (A-s): 0.007 Peak Height (A): 0.012
Background Pk Area (A-s): 0.054 Background Pk Height (A): 0.038
Blank Corrected Pk Area (A-s): 0.000
Concentration (ug/L): 0.12

Mean Conc (ug/L): 0.20 ✓ SD: 0.115 RSD(%): 57.22

QC sample is within range

Pb ID: CRA Seq. No.: 00010 A/S Pos.: 33 Date: 05/31/94

Replicate 1 Time: 10:27
Peak Area (A-s): 0.019 Peak Height (A): 0.028
Background Pk Area (A-s): 0.058 Background Pk Height (A): 0.042
Blank Corrected Pk Area (A-s): 0.013
Concentration (ug/L): 3.86

Replicate 2 (Peak Stored) Time: 10:29
Peak Area (A-s): 0.017 Peak Height (A): 0.028
Background Pk Area (A-s): 0.059 Background Pk Height (A): 0.041
Blank Corrected Pk Area (A-s): 0.010
Concentration (ug/L): 3.07

Mean Conc (ug/L): 3.47 ✓ SD: 0.559 RSD(%): 16.13

QC sample is within range

Pb ID: CRAA Seq. No.: 00011 A/S Pos.: 38 Date: 05/31/94

Replicate 1 Time: 10:32
Peak Area (A-s): 0.081 Peak Height (A): 0.115
Background Pk Area (A-s): 0.083 Background Pk Height (A): 0.076
Blank Corrected Pk Area (A-s): 0.074
Concentration (ug/L): 22.87

Replicate 2 (Peak Stored) Time: 10:35
Peak Area (A-s): 0.082 Peak Height (A): 0.119
Background Pk Height (A): 0.077
Background Pk Area (A-s): 0.083
Blank Corrected Pk Area (A-s): 0.075

11/8/94

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U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS_KNOXVILLE_____ Contract:HANFORD___

Lab Code: ITSTU_ Case No.: W0532 SAS No.: _____ SDG No.: W0063_
Matrix: __SOIL_____ Level (low/med): _LOW____
% Solids for Sample: _80.3

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	65.9128		12.4533	U	124.53	52.9	N	P
Arsenic	75-125	12.7591		3.9283		9.86	89.6		F
Barium	75-125	603.3998		114.7621		498.13	98.1		P
Beryllium	75-125	13.6115		0.9240	B	12.45	101.9		P
Cadmium	75-125	12.4732		1.2453	U	12.45	100.2		P
Calcium									NR
Chromium	75-125	69.2403		18.7846		49.81	101.3		P
Cobalt	75-125	135.1532		12.0822	B	124.53	98.8		P
Copper	75-125	75.7933		15.9054		62.27	96.2		P
Iron									NR
Lead	75-125	11.5409		5.7704		4.93	117.0		F
Magnesium									NR
Manganese	75-125	540.7347		389.7385		124.53	121.3		P
Mercury	75-125	0.7092		0.1245	U	0.62	114.4		CV
Nickel	75-125	135.8257		14.5430		124.53	97.4		P
Potassium									NR
Selenium	75-125	2.0468		0.4932	U	2.47	82.9		F
Silver	75-125	13.8680		1.8331	B	12.45	96.7		P
Sodium									NR
Thallium	75-125	8.6187		0.4932	U	12.33	69.9	N	F
Vanadium	75-125	170.7547		49.8655		124.53	97.1		P
Zinc	75-125	159.7609		40.2889		124.53	95.9		P
Cyanide									NR

Comments:

FORM V (Part 1) - IN ILM02.1

11/8/94

028

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOBJ13

Lab Name: ITAS_KNOXVILLE_____ Contract:HANFORD___

Lab Code: ITSTU_ Case No.: W0532 SAS No.: _____ SDG No.: W0063_
Matrix: __SOIL_____ Level (low/med): _LOW____
% Solids for Sample: _80.3

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									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide	75-125	9.2427		24.4182	U	24.34	38.0	N	AS

Comments:

11/18/94

ACCURACY DATA SUMMARY

SDG: W0063	VALIDATOR: S. Schulolt	DATE: 11/3/94	PAGE 1 OF 1	
COMMENTS: Inorganics, Analytical Spike				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
BOBJ13	Se	83.8	BOBJ13	UJ
BOBJ13	Tl	74.2	BOBJ13	~~UJ~~ none, previously qualified
BOBJ15	Se	73.8	BOBJ15	UJ
BOBJ15	Tl	69.7	BOBJ15	none, previously qualified

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RECORD COPY

Nov-Dec 11-11-94
OCT 1994
RECEIVED
Validation
Log In

MEMORANDUM

TO: 200-UP-1 Project QA Record

November 10, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0063-ITC-071 (943-1610.035,071gen.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0063-ITC-071 prepared by International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BJ13* B0BJ15	5/9/94 5/17/94	SOIL SOIL	SEE NOTE 1

Note 1: The samples were analyzed for anions and nitrate/nitrite using SW-846 methods, B0BXB4 was also analyzed for cyanide.
* - Indicates sample results which were 100% recalculated.

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 to this memo 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.

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Completeness. The data package was complete for all requested analyses. Two samples (2) were validated in this data set with a total of 14 determinations reported all of which were deemed valid. This results in a completeness of 100% which does not meet normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

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 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

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0063-ITC-071	REVIEWER: S. Schildt	DATE: 11/8/94	PAGE 1 OF 1
COMMENTS: General Chemistry			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
No qualification required			

9615490.0781

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0063-ITC-071

	Samp#	BOBJ13		BOBJ15	
	Date	5-9-94		5-17-94	
	Location	699-38-68A		699-38-68A	
	Depth	185.00 - 187.00		216.00 - 218.00	
	Type	SOIL		SOIL	
	Comments				
Parameter	Units	Result	Q	Result	Q
FLUORIDE	MG/KG	0.500		0.900	
CHLORIDE	MG/KG	0.800		4.200	
NITRITE	MG/KG	0.400	U	0.400	U
NITRATE	MG/KG	5.000		18.000	
PHOSPHATE	MG/KG	1.000	U	1.000	U
SULFATE	MG/KG	13.000		37.000	
NITRATE+NITRITE	MG-N/KG	1.550		6.780	

The decimal places shown do not reflect the precision reported by the laboratory

Verified 11/10/94

008

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	532
Client Sample ID:	BOBJ13	Preparation Date:	05/31/94
Lab Sample ID:	AA8771	Analysis Date:	05/31/94
Sample Matrix:	Soil	Concentration Units:	mg/kg

Compound	Result	Qualifier Q	Detection Limit
fluoride	0.5	+	0.4
chloride	0.8	+	0.4
nitrite	0.4	~~U~~ UR 11/10/94	0.4
nitrate	5.0	~~+~~ J	1.2
phosphate	1.0	~~U~~ UR	1.0
sulfate	13	+	4.5

11/10/94

+ - 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:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	532
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg	Analysis Date:	06/03/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6280	0.50	U
BOBJ13	AA8772	1.55	+

11/10/94

+ - 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:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	576
Client Sample ID:	BOBJ15	Preparation Date:	06/13/94
Lab Sample ID:	AA9563	Analysis Date:	06/13/94
Sample Matrix:	Soil	Concentration Units:	mg/kg

Compound	Result	Qualifier	Q	Detection Limit
fluoride	0.9	+		0.4
chloride	4.2	+		0.4
nitrite	0.4	~~U~~	UR	0.4
nitrate	18	~~+~~	~~J~~ 11/10/94	4.0
phosphate	1.0	~~U~~	UR	1.0
sulfate	37	+		4.5

11/10/94

+ - 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:	W0063
Contract Name:	Westinghouse Hanford	Job Number:	576
Sample Matrix:	Soil	Extraction Date:	N/A
Concentration Units:	mg/kg	Analysis Date:	06/03/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6280	0.50	U
BOBJ15	AA9564	6.78	+

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

11/10/94

3613490.0787

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9613490.0788

0000001

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

RECORD COPY

June 27, 1994

Job Number: 532 & 576

This is the Certificate of Analysis for the following samples:

SDG:	W0063
Client Project ID:	WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1
Date Received by Lab:	May 13 & May 21, 1994
Number of Samples:	Three (3)
Sample Type:	Soil

I. Introduction

On May 13 and May 21, 1994, three (3) soil samples 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.

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

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

JUL 1994
RECEIVED
SDLA

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

11/8/94

014

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

II. Analytical Results/Methodology (Continued)

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 volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Finnigan INCOS 500 GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were within method specified limits.

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.

The samples for work order #532 were digested on May 16, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 17, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 20 through May 31, 1994; the remaining metals were analyzed by ICP on June 7, 1994. All run QC was acceptable A duplicate and a spike were analyzed using sample BOBJ13. Spike recovery (accuracy) results were within acceptance limits for all requested parameters except for antimony by ICP and thallium by GFAA analysis. Poor spike recovery for these two analyte appeared to be attributable to matrix interferences. Duplicate RPD (precision) results were within acceptance limits for all requested parameters. The detection limit for cyanide was elevated due to matrix interference.

11/8/9

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control

The samples for work order #576 were digested on May 24, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on May 27, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from May 24 through May 27, 1994; the remaining metals were analyzed by ICP on May 26, 1994. All run QC was acceptable. The samples were batched with QC from work order #532.

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.

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.

The samples were analyzed for fluoride, chloride, nitrite, nitrate, phosphate and sulfate on May 31 and June 13, 1994 using EPA method 300.0. Matrix spike and matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

The samples were analyzed for nitrate/nitrite on June 3, 1994. Matrix spike and a matrix spike duplicate analyses were performed using sample BOBJ13. All QC results were acceptable.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

Knoxville ID	Richland ID	WHC ID	Test
AA8767	405245-01A	BOBJ13	VOC
AA8768	405245-01B	"	SVOC
AA8769	405245-01C	"	METALS-T
AA8770	405245-01D	"	CYANIDE
AA8771	405245-01E	"	ANIONS
AA8772	405245-01F	"	NO3NO2
AA8776	405245-02A	BOBJ14	VOC
AA9559	405443-01A	BOBJ15	VOC
AA9560	405443-01B	"	SVOC
AA9561	405443-01C	"	METAL-T
AA9562	405443-01D	"	CYANIDE
AA9563	405443-01E	"	ANIONS
AA9564	405443-01F	"	NO3NO2

11/18/94

IT Corporation
June 27, 1994
Job Number: 532 & 576
Client Project ID: WHC SAF-94-046 200-UP-1 Soil Sampling - Round 1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

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

11/8/94

WO#532

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: 699-38-68A	SAF No.: 94-046
Ice Chest No.: EFS101	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0518-46	Bill of Lading/Air Bill No.: NONE

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE ~~3D~~ AJS 5/10/94 X AJS 5/10/94 12D

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	G	G	G	P/G	P/G			aG	aGs			
No. of Container(s)	1	1	1	1	1	1	1	1			1	1			
Volume	125ml	500ml	500ml	250ml	250ml	125ml	1500ml	500ml		WVS 5-9-94	~~40ml~~ 250/20	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)	ACTIVIT SCAN			
405245	A	B	C	D	E	F	4052	4601			02 A				

Sample No.	Matrix*	Date Sampled	Time Sampled															
B0BJ13 01	S	5-9-94	0905	✓	✓	✓	✓	✓	✓	✓	✓							
B0BJ14 02	S	5-9-94	0700											✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-10-94 1205	O.J. Simpson	5-10-94 1205
O.J. Simpson	5-12-94 1000	K. Sweeney L. Sweeney	5/12/94 1000
K. Sweeney L. Sweeney	5/12/94 1200	Karen Achterberg	5-12-94 12:00

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

LOWEST HOLDING TIME = 7DAYS

SDG W0063

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)

RKC 11/2/94

9613490.0793

0000021

019

W#570

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: 699-	SAF No.: 94-046
Ice Chest No.: SML-549	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0594-8	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			
Type of Container			aGs	aG	G	G	G	G	P/G				aG	aGs			
No. of Container(s)			1	1	1	1	1	1	1				1	1			
Volume			125ml	500ml	500ml	250ml	250ml	125ml	1500ml				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				VOA (TRIP)	ACTIVIT SCAN			
46544301			A	B	C	D	E	F	40544401								
Sample No.	Matrix*	Date Sampled	Time Sampled														
BOBJ15	S	5-17-94	0910	✓	✓	✓	✓	✓	✓	✓				✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-17-94 1155	A Simpson	5/20/94 1155
A Simpson	5/20/94 0835	L Sweeney L Sweeney	0835 5/20/94
L Sweeney L Sweeney	1200 5/20/94	[signature] ITAS	1200 5/20/94

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

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)

9613490.0794

0000022

020 11/2/94

9613420.0795

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E

PROJECT: 200-UP-1		DATA PACKAGE: W0063-ITC-071	
VALIDATOR: L. Schilds	LAB: IT		DATE: 11/7/94
CASE: NA		SDG: W0063	

ANALYSES PERFORMED

☑ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☑ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B0BJ13, B0BJ15 / 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 11/10/94

Comments: ~~HO_3, NO_2, PO_4 holding time greatly exceeded.~~ 11/10/94

022

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

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

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

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

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

Comments:

4. BLANKS

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

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

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

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

Comments:

5. ACCURACY

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

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

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

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

Comments: No LCS reported for NO_3/NO_2, no qualification required

6. PRECISION

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

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

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

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

023

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

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: W0063-ITC-071 | VALIDATOR: S. Schilolt | DATE: 11/7/94 | PAGE 1 OF 1

COMMENTS: General Chemistry

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBJ13	NO_3/NO_2	5/9/94	NA	6/3/94	NA	25	none
BOBJ15	↓	5/17/94	NA	↓	NA	17	none
BOBJ13	anions	5/9/94	5/31/94	5/31/94	22	~~22~~ 0	none
BOBJ15	↓	5/17/94	6/13/94	6/13/94	27	~~27~~ 0	none
BOBJ13	NO_2, ~~NO_3~~, PO_4	5/9/94	5/31/94	5/31/94	22	~~22~~ 0	none ~~UR~~
BOBJ15	↓	5/17/94	6/13/94	6/13/94	27	~~27~~ 0	none ~~UR~~
BOBJ13	NO_3	5/9/94	5/31/94	5/31/94	22	~~22~~ 0	none ~~J~~
BOBJ15	NO_3	5/17/94	6/13/94	6/13/94	27	~~27~~ 0	none ~~J~~
							[illegible] 11/10/94

9613490.0800
RECORD COPY

OCT 1994
RECEIVED
Validation
Log In

MEMORANDUM

TO: 200-UP-1 Project QA Record

November 8, 1994

FR: Susan Manchester, Golder Associates Inc. for SGM

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0063-ITC-071 (943-1610.035, Filename 071RAD.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0063-ITC-071 prepared by the International Technology Corporation (ITC) Laboratory. Sample information is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS	COMMENTS
B0BJ13 B0BJ15*	SOIL SOIL	RADIOCHEMISTRY, SEE ATTACHMENT 4	NONE
* 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 exceptions of the deficiencies identified below.

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

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

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 44 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90 percent.

001

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Laboratory Blanks

- Strontium-90 was detected in the laboratory blank. Attachments 2 and 5 provide a summary of the data qualification applied and supporting documentation.

Matrix Spike Recovery

- The matrix spike recovery for neptunium-237 was unacceptable. Attachments 2 and 5 provide a summary of the data qualification applied and supporting documentation.

Laboratory Control Sample Recovery

- The laboratory control sample percent recovery (LCS %R) for americium-241 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

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 Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613490.0904

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: W0063-ITC-071	VALIDATOR:	DATE: November 4, 1994	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
STRONTIUM-90	J	B0BJ13 B0BJ15	PRESENT IN THE ASSOC. LAB BLANK
NEPTUNIUM-237	J -DETECTS UJ - NONDETECTS	B0BJ13 B0BJ15	MS %R < 60% BUT > 10%
AMERICIUM-241	UJ	B0BJ13 B0BJ15	LCS %R < 70% BUT > 30%

9613490.0006

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0063-ITC-071

	Samp#	BOBJ13		BOBJ15	
	Date	5-9-94		5-17-94	
	Location	699-38-68A		699-38-68A	
	Depth	185.00 - 187.00		216.00 - 218.00	
	Type	SOIL		SOIL	
	Comments				
Parameter	Units	Result	Q	Result	Q
AMERICIUM-241	pCi/G	0.026	UJ	0.018	UJ
CURIUM-242	pCi/G	0.029	U	0.022	U
CURIUM-244	pCi/G	0.026	U	0.012	U
NEPTUNIUM-237	pCi/G	0.021	J	0.017	UJ
PLUTONIUM-238	pCi/G	0.015	U	0.024	U
PLUTONIUM-239/240	pCi/G	0.031	U	0.021	
URANIUM-234	pCi/G	0.910		0.854	
URANIUM-235	pCi/G	0.060		0.035	
URANIUM-238	pCi/G	1.070		0.804	
COBALT-58	pCi/G	0.013	U	0.012	U
COBALT-60	pCi/G	0.011	U	0.012	U
CESIUM-137	pCi/G	0.009	U	0.010	U
EUROPIUM-152	pCi/G	0.060		0.086	
EUROPIUM-154	pCi/G	0.035	U	0.034	U
EUROPIUM-155	pCi/G	0.042		0.048	
IRON-59	pCi/G	0.036	U	0.032	U
RUTHENIUM-106	pCi/G	0.084	U	0.092	U
IODINE-129	pCi/G	0.893	U	0.867	U
GROSS ALPHA	pCi/G	9.880		8.960	
GROSS BETA	pCi/G	25.400		24.000	
STRONTIUM-90	pCi/G	0.287	J	0.372	J
TECHNETIUM-99	pCi/G	0.522	U	0.522	U

The decimal places shown do not reflect the precision reported by the laboratory

Verified 11-7-94

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

SAMPLE RESULTS

Borehole 699-38-68A
185' - 187'

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	40524601	MATRIX:	SOIL
WHC ID:	B0BJ13	DATE RECEIVED:	5/12/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	Q
AM-241	1.94E-02	2.07E-02	2.09E-02	2.57E-02	pCi/g	80.80%	RD3302	UJ
CM-242	1.82E-02	2.22E-02	2.24E-02	2.93E-02	pCi/g	80.80%	RD3302	U
CM-244	9.12E-03	1.47E-02	1.48E-02	2.59E-02	pCi/g	80.80%	RD3302	U
NP-237	2.08E-02	1.86E-02	1.92E-02	1.13E-02	pCi/g	100.00%	RD3208	J
PU-238	0.00E+00	0.00E+00	1.64E-02	1.48E-02	pCi/g	76.00%	RD3209	U
PU239/40	3.29E-03	1.14E-02	1.14E-02	3.09E-02	pCi/g	76.00%	RD3209	U
U-234	9.10E-01	1.80E-01	2.27E-01	6.06E-02	pCi/g	47.20%	RD3234	
U-235	6.03E-02	4.67E-02	4.76E-02	4.03E-02	pCi/g	47.20%	RD3234	
U-238DA	1.07E+00	1.95E-01	2.54E-01	4.71E-02	pCi/g	47.20%	RD3234	
CO-58	-4.49E-03	7.91E-03	7.92E-03	1.27E-02	pCi/g	N/A	RD3219	U
CO-60	2.52E-03	6.76E-03	6.76E-03	1.13E-02	pCi/g	N/A	RD3219	U
CS-137DA	1.12E-03	5.56E-03	5.56E-03	9.44E-03	pCi/g	N/A	RD3219	U
EU-152	5.96E-02	3.18E-02	3.24E-02	5.73E-02	pCi/g	N/A	RD3219	
EU-154	-3.31E-02	2.19E-02	2.21E-02	3.51E-02	pCi/g	N/A	RD3219	U
EU-155	4.15E-02	1.71E-02	1.76E-02	2.94E-02	pCi/g	N/A	RD3219	
FE-59	-6.58E-03	2.23E-02	2.23E-02	3.61E-02	pCi/g	N/A	RD3219	U
RU-106DA	2.39E-02	4.92E-02	4.93E-02	8.38E-02	pCi/g	N/A	RD3219	U
I-129LP	1.64E-01	5.05E-01	5.05E-01	8.93E-01	pCi/g	N/A	RD3219	U
ALPHA	9.88E+00	4.59E+00	4.71E+00	5.00E+00	pCi/g	100.00%	RD3222	
BETA	2.54E+01	2.61E+00	3.11E+00	2.77E+00	pCi/g	100.00%	RD3222	
STRONTIUM	2.87E-01	8.52E-02	1.09E-01	1.61E-01	pCi/g	71.90%	RD3204	J
TC-99	-6.53E-02	2.22E-01	1.05E+00	5.22E-01	pCi/g	100.00%	ITAS-IT-RS-0001	U

Number of Results: 22

Verified
sgn 11/04/94

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

SAMPLE RESULTS

Borehole 699-38-68A
216'-218'

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	40544401	MATRIX:	SOIL
WHC ID:	B0BJ15	DATE RECEIVED:	5/20/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	Q
AM-241	-3.63E-04	7.26E-04	7.28E-04	1.83E-02	pCi/g	91.70%	RD3302	UJ
CM-242	-4.36E-04	8.72E-04	8.75E-04	2.20E-02	pCi/g	91.70%	RD3302	U
CM-244	0.00E+00	0.00E+00	1.37E-02	1.24E-02	pCi/g	91.70%	RD3302	U
NP-237	-3.33E-04	6.66E-04	6.70E-04	1.67E-02	pCi/g	100.00%	RD3208	UJ
PU-238	-1.72E-03	2.43E-03	2.44E-03	2.43E-02	pCi/g	97.10%	RD3209	U
PU239/40	2.06E-02	1.93E-02	1.94E-02	2.05E-02	pCi/g	97.10%	RD3209	
U-234	8.54E-01	1.46E-01	1.86E-01	3.68E-02	pCi/g	67.00%	RD3234	
U-235	3.53E-02	3.05E-02	3.09E-02	3.32E-02	pCi/g	67.00%	RD3234	
U-238DA	8.04E-01	1.42E-01	1.78E-01	3.84E-02	pCi/g	67.00%	RD3234	
CO-58	-2.49E-03	7.30E-03	7.31E-03	1.17E-02	pCi/g	N/A	RD3219	U
CO-60	7.17E-03	6.45E-03	6.49E-03	1.16E-02	pCi/g	N/A	RD3219	U
CS-137DA	-2.33E-03	6.03E-03	6.03E-03	9.94E-03	pCi/g	N/A	RD3219	U
EU-152	8.55E-02	3.41E-02	3.52E-02	6.28E-02	pCi/g	N/A	RD3219	
EU-154	8.65E-04	2.05E-02	2.05E-02	3.44E-02	pCi/g	N/A	RD3219	U
EU-155	4.77E-02	1.83E-02	1.89E-02	3.14E-02	pCi/g	N/A	RD3219	
FE-59	-7.00E-03	2.02E-02	2.02E-02	3.25E-02	pCi/g	N/A	RD3219	U
RU-106DA	3.19E-02	5.46E-02	5.46E-02	9.19E-02	pCi/g	N/A	RD3219	U
I-129LP	1.21E-01	4.91E-01	4.91E-01	8.67E-01	pCi/g	N/A	RD3219	U
ALPHA	8.96E+00	4.40E+00	4.51E+00	4.99E+00	pCi/g	100.00%	RD3222	
BETA	2.40E+01	2.52E+00	2.98E+00	2.61E+00	pCi/g	100.00%	RD3222	
STRONTIUM	3.72E-01	7.66E-02	1.26E-01	1.32E-01	pCi/g	100.00%	RD3204	J
TC-99	-3.58E-01	2.17E-01	1.03E+00	5.22E-01	pCi/g	100.00%	ITAS-IT-RS-0001	U

Number of Results: 22

Verified
sgm 11/04/94

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

July 11, 1994

Attention: J.A.Lerch

SAF Number	:	94-046
Date SDG Closed	:	May 12, 1994
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0063
Data Deliverable	:	Stand Alone

I. Introduction

On May 12 and 20, 1994, two 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
405246-01A	B0BJ13	Soil	5/12/94
405444-01A	B0BJ15	Soil	5/20/94

II. Analytical Results/Methodology

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

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

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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
Iodine-129 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 W0063 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 II.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The batch was reanalyzed due to a low LCS radiochemical recovery (40%). The reanalysis also indicated a problem with the IQO spike used for the LCS. The original spike was recounted and the results duplicated the first count of the spike. The low radiochemical recovery is believed to be isolated to the LCS and the IQO spike is under investigation. The EQJN spike, also used in the Am-241 analysis, has been analyzed simultaneously with the IQO spike and has not shown any difficulties with radiochemical recoveries. The original data are accepted and reported. The batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Neptunium-237 by method ITAS-RD-3208
The batch was reanalyzed due to a suspected sample and matrix spike switch. The reanalysis data are accepted and reported. The LCS, matrix spike, batch blank, sample and sample duplicate (duplicate of sample B0BJ13 and B0BJ15) results are within contractual requirements.

Plutonium-238, 239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Uranium-234, 235, 238 by method ITAS-RD-3234
The sample duplicate result for U-235 is not within 3 sigma of the sample U-235 result. The sample duplicate data are accepted based on acceptable U-234 and U-238 agreement with the sample. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ15) results are accepted and reported.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Cd-109 was detected in samples B0BJ13, B0BJ15, and the duplicate of sample B0BJ13, however, the results are not reported because they are suspected false positive results caused by x-ray lines produced by energy reflection from the detector shielding. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Iodine-129 by method ITAS-RD-3219
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
Sample B0BJ13 and the duplicate of sample B0BJ13 were recounted because their results were outside of the 3 sigma control limit on the initial count. The recount is accepted and reported. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204
The results for sample B0BJ13 and the duplicate of sample B0BJ13 were not within the 3 sigma control limit. The results are accepted because the results are less than the contractual detection limit, and also because of the nonhomogeneous nature of the soil matrix. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are accepted and reported.

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3247
Carbon-14 results are not reportable for these samples due to an insufficient presence of 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 produced insufficient carbon dioxide during sample preparation. Two separate attempts were made to extrude carbon from the sample matrices. The sample results are considered unreportable due to a matrix effect (lack of carbon in the matrix).

Technetium-99 by method ITAS-IT-RS-0001
The matrix spike, LCS, batch blank, sample and sample duplicate (duplicate of sample B0BJ13) results are within contractual requirements.

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

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: 699-38-68A	SAF No.: 94-046
Ice Chest No.: EFS101	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0518-46	Bill of Lading/Air Bill No.: NONE

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE ~~3D~~ AJS 5/10/94 X AJS 5/10/94 1213

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	G	G	G	P/G	P/G			aG	aGs			
No. of Container(s)	1	1	1	1	1	1	1	1			1	1			
Volume	125ml	500ml	500ml	250ml	250ml	125ml	1500ml	500ml		WVS 5-9-94	~~250~~ 120 ~~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)	ACTIVIT SCAN			
405245	A	B	C	D	E	F	40524601				02 A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
B0BJ13 01	S	5-9-94	0905	✓	✓	✓	✓	✓	✓	✓	✓						
B0BJ14 02	S	5-9-94	0700											✓			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W. V. Setzer	Date/Time: 5-10-94 1205	Received By: A J Simpson	Date/Time: 5-10-94 1205
Relinquished By: A J Simpson	Date/Time: 5-12-94 1000	Received By: L Sweeney L Sweeney	Date/Time: 5/12/94 1000
Relinquished By: L Sweeney L Sweeney	Date/Time: 5/12/94 1200	Received By: Karen Hartenberg	Date/Time: 5-12-94 12:00
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

LOWEST HOLDING TIME = 7DAYS

SDG W0063

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)

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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: 699-	SAF No.: 94-046
Ice Chest No.: SML-549	Field Logbook No.: EFL-1118	Method of Shipment: BY COMPANY VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0-0544-8	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			
Type of Container	aGs	aG	G	G	G	G	P/G				aG	aGs			
No. of Container(s)	1	1	1	1	1	1	1				1	1			
Volume	125ml	500ml	500ml	250ml	250ml	125ml	1500ml				40ml	40ml			
SAMPLE ANALYSIS 46544301	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 40544 d				VOA (TRIP)	ACTIVIT SCAN			

Sample No.	Matrix*	Date Sampled	Time Sampled														
BOB.515	S	5-17-94	0910	✓	✓	✓	✓	✓	✓	✓					✓		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W. V. Setzer	5-17-94 1155	[signature]	5/17/94 1155
[signature]	5/20/94 0835	[signature]	0835 5/20/94
[signature]	1200 5/20/94	[signature] STAS	1200 5/20/94
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(EP-60,070,170) Am-241,Cm 243/244 (EP-60,070,960) Np-237 (EP-60,070,930) Pu-238,239/240 (EP-60,070,940) U-234,235,238 (EP-60,070,901) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (EP-60,070,100) Sr-90 (EP-60,070,500,519,520) I-129 (EP-024,560) C-14 (EP-060,251)Tc-99 (EP-020,540)

STANDALONE DELIVERABLES

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)

9613490.0817

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-1			DATA PACKAGE: W0063-ITC-071		
VALIDATOR: sgm		LAB: ITC		DATE: 11/03/94	
CASE:			SDG: W0063-ITC-071		
ANALYSES PERFORMED					
☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX Soils

B0BJ13

B0BJ15

1. Completeness . . . . . ☐ N/A

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

Comments:

2. Initial Calibration . . . . . ☐ N/A

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

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

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

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

Comments:

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

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

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . (Yes) No N/A
Analytes detected in method blank? . . . . . (Yes) No N/A
Field blank(s) analyzed? . . . . . Yes (No) N/A
Field blank results acceptable? . . . . . Yes No (N/A)
Analytes detected in field blank(s)? . . . . . Yes No (N/A)
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: Sr-90 was detected in the lab blank at 0.147 pCi/g. Therefore, since the assoc. sample results < 5x blank conc, they have been qualified as estimated (J).

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . (Yes) No N/A
Spike recoveries acceptable? . . . . . Yes (No) N/A
Spike source traceable? . . . . . (Yes) No N/A
Spike source expired? . . . . . Yes (No) N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: The MS%R for Np-237 are 56% and 39% - which are <60% control limit but ~~the~~ >110% control limit. Therefore, the Np-237 results have been qualified as estimated ~~(J)~~. (J/UJ). agm 11/3/94 agm 11/03/94

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

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

Comments: LCS %R for Am-241 is 40.5% which is < 70% but > 30%. Therefore, the assoc. results have been qualified as estimated (UJ).

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:

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . . . . Yes (No) N/A
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes (No) N/A
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes (No) N/A
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments:

10. Holding Times

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

Comments: Samples B0RT13 and B0RT15 were collected on 5/09/94 and 5/17/94, respectively. The rad chem analyses were performed in June and July of 1994 which is within the 180 day holding time.

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

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

Comments: Carbon-14 was not reported due to an insufficient amount of carbon present in the sample. No qualification is required.

9613490.0823

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

BLANK RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	L052461B	MATRIX:	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	-1.54E-03	1.54E-03	1.56E-03	2.58E-02	pCi/g	86.40%	RD3302
CM-242	-8.68E-04	1.23E-03	1.23E-03	2.48E-02	pCi/g	86.40%	RD3302
CM-244	-3.87E-04	7.74E-04	7.76E-04	1.95E-02	pCi/g	86.40%	RD3302
PU-238	0.00E+00	0.00E+00	1.89E-02	1.70E-02	pCi/g	66.20%	RD3209
PU239/40	0.00E+00	0.00E+00	1.89E-02	1.70E-02	pCi/g	66.20%	RD3209
U-234	1.45E-02	1.89E-02	1.90E-02	2.89E-02	pCi/g	76.80%	RD3234
U-235	4.56E-03	1.09E-02	1.09E-02	2.48E-02	pCi/g	76.80%	RD3234
U-238DA	2.00E-02	2.18E-02	2.19E-02	2.89E-02	pCi/g	76.80%	RD3234
CO-58	2.31E-03	2.46E-03	2.47E-03	4.47E-03	pCi/g	N/A	RD3219
CO-60	-8.09E-04	2.05E-03	2.06E-03	3.49E-03	pCi/g	N/A	RD3219
CS-137DA	-1.10E-03	2.20E-03	2.21E-03	3.48E-03	pCi/g	N/A	RD3219
EU-152	1.09E-02	1.10E-02	1.10E-02	2.08E-02	pCi/g	N/A	RD3219
EU-154	-9.39E-03	7.06E-03	7.12E-03	1.09E-02	pCi/g	N/A	RD3219
EU-155	2.02E-03	6.07E-03	6.07E-03	9.62E-03	pCi/g	N/A	RD3219
FE-59	-1.98E-03	5.82E-03	5.82E-03	9.87E-03	pCi/g	N/A	RD3219
RU-106DA	1.47E-02	1.74E-02	1.74E-02	3.12E-02	pCi/g	N/A	RD3219
I-129LP	4.87E-02	2.89E-01	2.89E-01	5.28E-01	pCi/g	N/A	RD3219
ALPHA	2.27E-02	5.37E-02	5.38E-02	1.22E-01	pCi/s	100.00%	RD3222
BETA	2.38E-01	2.76E-01	2.76E-01	5.73E-01	pCi/s	100.00%	RD3222
STRONTIUM	1.47E-01	6.69E-02	7.58E-02	1.46E-01	pCi/g	82.70%	RD3204
TC-99	3.11E-01	2.28E-01	1.08E+00	5.22E-01	pCi/g	100.00%	ITAS-IT-RS-0001

Number of Results: 21

Qualify Sr-90 results as estimated (J).

sgm 11/03/94

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024

682A-6-93

9613490.0824

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

MATRIX SPIKE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	W0544401	MATRIX:	SOIL

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
NP-237	3.24E+00	2.32E-01	7.36E-01	1.13E-02	pCi/g	-3.33E-04	5.74E+00	56.45%
TC-99	5.95E+01	7.13E-01	7.40E+00	5.22E-01	pCi/g	-3.58E-01	6.76E+01	88.02%

Number of Results: 2

Qualify Np-237 results as estimated (J/UJ).

AGM 11/03/94

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~~0019~~

*Spike Result Corrected For Sample Result

682A-6-93

9613490.0825

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

MATRIX SPIKE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	W054441D	MATRIX:	SOIL

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
NP-237	2.25E+00	1.94E-01	5.23E-01	1.90E-02	pCi/g	-3.33E-04	5.75E+00	39.13%

Number of Results: 1

Qualify Np-237 results as estimated (J/UJ).

AGM 11/03/94

026

~~0020~~

*Spike Result Corrected For Sample Result

682A-6-93

9613490.0826

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

LABORATORY CONTROL SAMPLE

LAB NAME:	ITAS-RICHLAND	SDG:	W0063
LAB SAMPLE ID:	L052461S	MATRIX:	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	EXPECTED	RECOVERY
AM-241	1.83E+00	1.55E-01	2.93E-01	1.32E-02	pCi/g	126.80%	4.52E+00	40.49%
PU239/40	3.42E+00	2.89E-01	5.38E-01	2.92E-02	pCi/g	68.30%	3.40E+00	100.59%
U-234	1.47E+00	1.75E-01	2.55E-01	2.79E-02	pCi/g	79.80%	1.63E+00	90.18%
U-235	7.06E-02	3.92E-02	4.02E-02	3.10E-02	pCi/g	79.80%	7.42E-02	95.15%
U-238DA	1.48E+00	1.76E-01	2.58E-01	2.95E-02	pCi/g	79.80%	1.70E+00	87.06%
CS-137DA	4.97E-01	2.92E-02	5.76E-02	N/A	pCi/g	N/A	4.80E-01	103.54%
RA-226DA	1.01E+00	4.90E-02	1.12E-01	N/A	pCi/g	N/A	1.16E+00	87.07%
I-129LP	1.09E+01	1.07E+00	1.53E+00	N/A	pCi/g	N/A	9.01E+00	120.98%
ALPHA	4.67E+00	4.43E-01	8.97E-01	8.60E-02	pCi/s	100.00%	4.51E+00	103.55%
BETA	1.21E+01	7.65E-01	1.15E+00	5.37E-01	pCi/s	100.00%	1.13E+01	107.08%
STRONTIUM	5.11E+00	2.57E-01	1.30E+00	1.40E-01	pCi/g	89.00%	6.02E+00	84.88%

Number of Results: 11

Qualify Am-241 results as estimated (UJ).

sgm 11/03/94

682A-6-93

Americium/Curium		
HEIS No.:	B0BJ13	B0BJ15
Lab ID:	40524601	40544401
Aliquot:	2.00E+00	2.00E+00
Am241 net cpm:	0.0188	-0.0004
Am241 bkg cpm:	0.0012	0.0004
Spl count time:	200	200
Bkg count time:	2500	2500
Eff d/c:	3.7	3.7
Decay:	1	1
Yield:	0.808	0.917
Am241 calc:	1.94E-02	-3.63E-04
Am241 rptd:	1.94E-02	-3.63E-04
Am241 MDA calc:	2.57E-02	1.83E-02
Am241 MDA rptd:	2.57E-02	1.83E-02
Cm244 net cpm:	0.0088	0
Cm244 bkg cpm:	0.0012	0
Cm244 decay:	1.005	1.005
Cm244 calc:	9.12E-03	0.00E+00
Cm244 rptd:	9.12E-03	0.00E+00
Cm244 MDA calc:	2.58E-02	1.24E-02
Cm244 MDA rptd:	2.59E-02	1.24E-02
Cm242 net cpm:	0.0142	-0.0004
Cm242 bkg cpm:	0.0008	0.0004
Cm242 decay:	1.243	1.201
Cm242 calc.:	1.82E-02	-4.36E-04
Cm242 rptd:	1.82E-02	-4.36E-04
Cm242 MDA calc:	2.93E-02	2.20E-02
Cm242 MDA rptd:	2.93E-02	2.19E-02

Neptunium		
HEIS No.:	B0BJ13	B0BJ15
Lab ID:	40524601	40544401
Aliquot:	2.00E+00	2.00E+00
Np237 net cpm:	0.025	-0.0004
Np237 bkg cpm:	0	0.0004
Spl count time:	200	200
Bkg count time:	2500	2500
Eff d/c:	3.7	3.7
Decay:	1	1
Yield:	1	1
Np237 calc:	2.08E-02	-3.33E-04
Np237 rptd:	2.08E-02	-3.33E-04
Np237 MDA calc:	1.13E-02	1.67E-02
Np237 MDA rptd:	1.13E-02	1.67E-02

Plutonium		
HEIS No.:	B0BJ13	B0BJ15
Lab ID:	40524601	40544401
Aliquot:	2.00E+00	2.00E+00
Pu238 net cpm:	0	-0.002
Pu238 bkg cpm:	0	0.002
Spl count time:	200	200
Bkg count time:	1000	1000
Pu238 Eff d/c:	3.703	3.703
Decay:	1.001	1.001
Yield:	0.76	0.971
Pu238 calc:	0.00E+00	-1.72E-03
Pu238 rptd:	0.00E+00	-1.72E-03
Pu238 MDA calc:	1.49E-02	2.43E-02
Pu238 MDA rptd:	1.48E-02	2.43E-02
Pu239 net cpm:	0.003	0.024
Pu239 bkg cpm:	0.002	0.001
Pu239 d/c:	3.7	3.7
Pu239 decay:	1	1
Pu239 calc:	3.29E-03	2.06E-02
Pu239 rptd:	3.29E-03	2.06E-02
Pu239 MDA calc:	3.10E-02	2.05E-02
Pu239 MDA rptd:	3.09E-02	2.05E-02

Uranium

HEIS No.:	B0BJ13	B0BJ15
Lab ID:	40524601	40544401
Aliquot:	2.00E+00	2.003
U-234 net cpm:	0.516	0.6876
U-234 bkg cpm:	0.004	0.0024
Spl count time:	200	200
Bkg count time:	2500	2500
Eff d/c:	3.7	3.7
Decay:	1	1
Yield:	0.472	0.67
U-234 calc:	9.11E-01	8.54E-01
U-234 rptd:	9.10E-01	8.54E-01
U-234 MDA calc:	6.06E-02	3.68E-02
U-234 MDA rptd:	6.06E-02	3.68E-02
U-235 net cpm:	0.0342	0.0284
U-235 bkg cpm:	0.0008	0.0016
U-235 decay:	1	1
U-235 calc:	6.04E-02	3.53E-02
U-235 rptd:	6.03E-02	3.53E-02
U-235 MDA calc:	4.03E-02	3.32E-02
U-235 MDA rptd:	4.03E-02	3.32E-02
U-238 net cpm:	0.6084	0.6472
U-238 bkg cpm:	0.0016	0.0028
U-238 decay:	1	1
U-238 calc.:	1.07E+00	8.04E-01
U-238 rptd:	1.07E+00	8.04E-01
U-238 MDA calc:	4.71E-02	3.84E-02
U-238 MDA rptd:	4.71E-02	3.84E-02

Gross Alpha		
HEIS No.:	B0BJ13	B0BJ15
Lab ID:	40524601	40544401
Aliquot:	4.98E-02	5.01E-02
Net counts:	0.218	0.198
Bkg counts:	0.032	0.032
Spl count time:	100	100
Bkg count time:	500	500
d/c:	5.008	5.032
Calc.:	9.88E+00	8.96E+00
Rptd:	9.88E+00	8.96E+00
MDA calc:	5.00E+00	4.99E+00
MDA rptd:	5.00E+00	4.99E+00

Gross Beta		
HEIS No.:	B0BJ13	B0BJ15
Lab ID:	40524601	40544401
Aliquot:	2.50E-01	2.50E-01
Net counts:	4.862	4.59
Bkg counts:	1.168	1.03
Spl count time:	100	100
Bkg count time:	500	500
d/c:	2.898	2.897
Calc.:	2.54E+01	2.40E+01
Rptd:	2.54E+01	2.40E+01
MDA calc:	2.77E+00	2.61E+00
MDA rptd:	2.77E+00	2.61E+00

Strontium 90		
HEIS No.:	B0BJ13	B0BJ15
Sample:	40524601	40544401
Sep date & time:	06/21/94	06/21/94
Count date & time:	06/22/94	06/22/94
Hours:	19.17	26.92
Sample amt:	6.14E+00	6.00E+00
Net, cpm:	1.586	2.708
Count time:	50	50
Bkg, cpm:	1.074	1.072
Count time:	500	500
D/C 1:	2.146	2.383
D/C 2:	1.821	1.91
D/C 3:	1.926	1.994
Yield:	0.719	1
Calc:	2.87E-01	3.72E-01
Rptd:	2.87E-01	3.72E-01
MDA, Calc:	1.61E-01	1.32E-01
MDA, rptd:	1.61E-01	1.32E-01

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Technetium-99		
HEIS No.:	B0BJ13	B0BJ15
Sample:	40524601	40544401
Bkg cpm:	27.46	27.46
Spl, amt:	2.00E+00	2.00E+00
Spl cpm:	26.87	25.73
Count time:	125	125
Spl dpm:	28.6	27.3
d/c:	1.064	1.061
Yield:	1	1
Blk, dpm:	2.89E+01	2.89E+01
Blk, d/c:	1.052	1.052
Calc:	-6.53E-02	-3.58E-01
Rptd:	-6.53E-02	-3.58E-01
MDA, calc:	5.22E-01	5.22E-01
MDA, rptd:	5.22E-01	5.22E-01