START 9613475.1104 W0022-ITC-035 0000001 0045246

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

June 6, 1994

Job Number: 279; 520

This is the Certificate of Analysis for the following samples:

SDG:	W0022
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 30 and May 12, 1994
Number of Samples:	Ten (10)
Sample Type:	Soil

JUN 1994 RECEIVED SDLA

I. Introduction

On March 30 and May 12, 1994, ten (10) 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. Soil results are reported on a dry weight basis.

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.

SEP 1996 RECEIVED EDMC

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company
June 6, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 279; 520

III. Quality Control

The samples for work order #279 were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 12 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. Samples were tracked with work order number 253.

The samples for work order #520 were digested on May 16, 1994 for ICP. The CVAA analysis for mercury was performed on May 17, 1994; the remaining metals were analyzed by ICP on May 17, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBNK4 for CVAA only. Spike recovery (accuracy) results were within acceptance limits. Duplicate RPD (precision) results were within acceptance limits. ICP analytes were tracked with QC from work order number 253. There was insufficient sample to analyze the samples by GFAA.

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.

Westinghouse Hanford Company
June 6, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 279; 520

IV. Certification

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

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company
June 6, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 279; 520

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
AA4853	403541-01A	BOBFMO	METALS
AA4854	403541-02A	BOBFM1	"
AA4855	403541-03A	BOBFM2	"
AA4856	403541-04A	BOBFM3	"
AA4857	403541-05A	BOBFL8	"
AA4858	403541-06A	BOBFL9	"
AA8551	405204-01A	BOBKN2	"
AA8552	405204-02A	BOBKN4	"
AA8553	405204-03A	BOBKN1	"
AA8554	405204-04A	BOBKN3	"

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HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-94-0083
Record of Disposition No.

DATE: April 4, 1994	LABORATORY: IT
PROJECT TITLE/NO.: 200-UP-2 SAF 94-065	NCR NO.: n/a

SAMPLE IDENTIFICATION NUMBERS:

all vegetation samples

DESCRIPTION OF EVENT:

It is anticipated that field sampling teams may not be able to collect sufficient sample volumes to meet the IT requirements for vegetation.

DISPOSITION OF SAMPLES:

In the event the inadequate vegetation sample volumes are provided to perform all requested analyses, IT is instructed to prioritize the requested analyses as listed below:

priority 1 - radiochemistry
priority 2 - metals

APPROVAL SIGNATURES:

J. A. Lerch — 4/4/94
CAS Project Coordinator (Print/Sign Name) — Date

M. A. Wasemiller — 4/11/94
Technical Representative (Print/Sign Name) — Date

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

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: W0279 SAS No.: _____ SDG No.:W0022_

SOW No.: ILM02

EPA Sample No.	Lab Sample ID
~~354101A~~ BOBFM0	AA4853
~~354102A~~ BOBFM1	AA4854
~~354103A~~ BOBFM2	AA4855
~~354104A~~ BOBFM3	AA4856
~~354105A~~ BOBFM8	AA4857
~~354106A~~ BOBFL9	AA4858

BOBFL8

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

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

Comments:

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

Signature: Christopher Kauker Name: Christopher Kauker

Date: May 4, 1994 Title: Chemist

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFMO
~~354101A~~ 005 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4853
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _92.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	419			P_
7440-36-0	Antimony_	15.8			P_
7440-38-2	Arsenic__	0.43	U	N	F_
7440-39-3	Barium___	18.9	B		P_
7440-41-7	Beryllium	0.21	U		P_
7440-43-9	Cadmium__	1.1	U		P_
7440-70-2	Calcium__	19900			P_
7440-47-3	Chromium_	2.1	U	*	P_
7440-48-4	Cobalt___	2.1	U		P_
7440-50-8	Copper___	6.9			P_
7439-89-6	Iron____	830			P_
7439-92-1	Lead____	0.75			F_
7439-95-4	Magnesium	4510			P_
7439-96-5	Manganese	59.5			P_
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	4.3	U		P_
7440-09-7	Potassium	1740			P_
7782-49-2	Selenium_	0.43	U		F_
7440-22-4	Silver___	1.1	U		P_
7440-23-5	Sodium___	71.6	B		P_
7440-28-0	Thallium_	0.43	U		F_
7440-62-2	Vanadium_	2.1	U		P_
7440-66-6	Zinc____	34.0			P_
	Titanium_	57.4			P_

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFM1
~~354102A~~ 8 6/6/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO279 SAS No.: SDG No.: W0022
Matrix (soil/water): SOIL Lab Sample ID: AA4854
Level (low/med): LOW Date Received: 03/30/94
% Solids: 91.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	578			P
7440-36-0	Antimony	10.4	U		P
7440-38-2	Arsenic	0.41	U	WN	F
7440-39-3	Barium	27.7	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	20800			P
7440-47-3	Chromium	2.1	U	*	P
7440-48-4	Cobalt	2.1	U		P
7440-50-8	Copper	4.1	B		P
7439-89-6	Iron	1110			P
7439-92-1	Lead	0.70			F
7439-95-4	Magnesium	3470			P
7439-96-5	Manganese	48.2			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	4.2	U		P
7440-09-7	Potassium	1130			P
7782-49-2	Selenium	0.41	U		F
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	75.6	B		P
7440-28-0	Thallium	0.41	U		F
7440-62-2	Vanadium	2.9	B		P
7440-66-6	Zinc	11.0			P
	Titanium	80.9			P

Color Before: N/A Clarity Before: N/A Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts: YES

Comments:
ARTIFACTS INCLUDE TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFM2
~~354103A~~ 003 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: W0279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4855
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _89.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	226			P
7440-36-0	Antimony_	11.1	U		P
7440-38-2	Arsenic__	0.42	U	WN	F
7440-39-3	Barium___	22.3	B		P
7440-41-7	Beryllium	0.22	U		P
7440-43-9	Cadmium__	1.1	U		P
7440-70-2	Calcium__	15400			P
7440-47-3	Chromium_	2.2	U	*	P
7440-48-4	Cobalt___	2.2	U		P
7440-50-8	Copper___	12.2			P
7439-89-6	Iron____	433			P
7439-92-1	Lead____	1.0			F
7439-95-4	Magnesium	4530			P
7439-96-5	Manganese	37.1			P
7439-97-6	Mercury__	0.11	U		CV
7440-02-0	Nickel___	4.4	U		P
7440-09-7	Potassium	8390			P
7782-49-2	Selenium_	0.42	U		F
7440-22-4	Silver___	1.1	U		P
7440-23-5	Sodium___	161	B		P
7440-28-0	Thallium_	0.42	U		F
7440-62-2	Vanadium_	2.2	U		P
7440-66-6	Zinc____	20.4			P
	Titanium_	32.3			P

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFM3 ~~354104A~~ 6/6/94

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO279 SAS No.: SDG No.: W0022

Matrix (soil/water): SOIL Lab Sample ID: AA4856

Level (low/med): LOW Date Received: 03/30/94

% Solids: 89.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	274			P
7440-36-0	Antimony	12.3	B		P
7440-38-2	Arsenic	0.44	U	WN	F
7440-39-3	Barium	19.9	B		P
7440-41-7	Beryllium	0.22	U		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	15600			P
7440-47-3	Chromium	2.2	U	*	P
7440-48-4	Cobalt	2.2	U		P
7440-50-8	Copper	7.9			P
7439-89-6	Iron	534			P
7439-92-1	Lead	0.55	B		F
7439-95-4	Magnesium	5850			P
7439-96-5	Manganese	41.3			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	4.3	U		P
7440-09-7	Potassium	5360			P
7782-49-2	Selenium	0.44	U		F
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium	77.1	B		P
7440-28-0	Thallium	0.44	U		F
7440-62-2	Vanadium	2.2	U		P
7440-66-6	Zinc	12.0			P
	Titanium	40.2			P

Color Before: N/A Clarity Before: N/A Texture: COARSE

Color After: COLORLESS Clarity After: CLEAR Artifacts: YES

Comments:

ARTIFACTS INCLUDE TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFL8 ~~354105A~~ 8S 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4857
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _88.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	192			P
7440-36-0	Antimony_	11.6	B		P
7440-38-2	Arsenic__	0.42	U	WN	F
7440-39-3	Barium___	27.3	B		P
7440-41-7	Beryllium	0.22	U		P
7440-43-9	Cadmium__	1.1	U		P
7440-70-2	Calcium__	21400			P
7440-47-3	Chromium_	2.2	U	*	P
7440-48-4	Cobalt___	2.2	U		P
7440-50-8	Copper___	6.2			P
7439-89-6	Iron____	278			P
7439-92-1	Lead____	0.47	B		F
7439-95-4	Magnesium	5990			P
7439-96-5	Manganese	25.7			P
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	4.5	U		P
7440-09-7	Potassium	4140			P
7782-49-2	Selenium_	0.42	U	W	F
7440-22-4	Silver___	1.1	U		P
7440-23-5	Sodium___	110	B		P
7440-28-0	Thallium_	0.42	U		F
7440-62-2	Vanadium_	2.2	U		P
7440-66-6	Zinc____	8.4			P
	Titanium_	19.1			P

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFL9 ~~354106A~~ 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4858
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _91.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	157			P_
7440-36-0	Antimony_	10.2	U		P_
7440-38-2	Arsenic__	0.42	U	WN	F_
7440-39-3	Barium__	33.9	B		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.0	U		P_
7440-70-2	Calcium__	28900			P_
7440-47-3	Chromium_	2.0	U	*	P_
7440-48-4	Cobalt___	2.0	U		P_
7440-50-8	Copper___	7.6			P_
7439-89-6	Iron____	298			P_
7439-92-1	Lead____	0.42	U		F_
7439-95-4	Magnesium	8160			P_
7439-96-5	Manganese	41.6			P_
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	4.1	U		P_
7440-09-7	Potassium	4740			P_
7782-49-2	Selenium_	0.42	U		F_
7440-22-4	Silver___	1.1	B		P_
7440-23-5	Sodium___	129	B		P_
7440-28-0	Thallium_	0.42	U		F_
7440-62-2	Vanadium_	2.0	U		P_
7440-66-6	Zinc____	9.7			P_
	Titanium_	19.7			P_

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN2

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8547

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1280			P
7440-36-0	Antimony	10.0	U		P
7440-39-3	Barium	25.0	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	7780			P
7440-47-3	Chromium	2.0	U	*	P
7440-48-4	Cobalt	2.0	U		P
7440-50-8	Copper	9.7			P
7439-89-6	Iron	2730			P
7439-95-4	Magnesium	2220			P
7439-96-5	Manganese	72.1			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	4.0	U		P
7440-09-7	Potassium	4840			P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	110	B		P
7440-62-2	Vanadium	6.2	B		P
7440-66-6	Zinc	16.2			P
	Titanium	191			P

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN4

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8552

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1870			P
7440-36-0	Antimony	9.3	U		P
7440-39-3	Barium	34.4	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.93	U		P
7440-70-2	Calcium	10100			P
7440-47-3	Chromium	2.5		*	P
7440-48-4	Cobalt	2.0	B		P
7440-50-8	Copper	11.7			P
7439-89-6	Iron	4150			P
7439-95-4	Magnesium	2260			P
7439-96-5	Manganese	154			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	3.7	U		P
7440-09-7	Potassium	2950			P
7440-22-4	Silver	0.93	U		P
7440-23-5	Sodium	85.3	B		P
7440-62-2	Vanadium	9.2	B		P
7440-66-6	Zinc	33.3			P
	Titanium	292			P

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN1

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8553

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	110			P
7440-36-0	Antimony	9.5	U		P
7440-39-3	Barium	7.2	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.95	U		P
7440-70-2	Calcium	2630			P
7440-47-3	Chromium	1.9	U	*	P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	5.6			P
7439-89-6	Iron	226			P
7439-95-4	Magnesium	1600			P
7439-96-5	Manganese	11.5			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	3.8	U		P
7440-09-7	Potassium	5930			P
7440-22-4	Silver	0.95	U		P
7440-23-5	Sodium	36.4	B		P
7440-62-2	Vanadium	1.9	U		P
7440-66-6	Zinc	6.9			P
	Titanium	16.8			P

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

1.
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN3

Lab Name: ITAS_KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1
Matrix (soil/water): SOIL Lab Sample ID: AA8554
Level (low/med): LOW Date Received: 05/12/94
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	96.6			P
7440-36-0	Antimony	10.0	U		P
7440-39-3	Barium	4.4	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2710			P
7440-47-3	Chromium	2.0	U	*	P
7440-48-4	Cobalt	2.0	U		P
7440-50-8	Copper	6.0			P
7439-89-6	Iron	182			P
7439-95-4	Magnesium	1020			P
7439-96-5	Manganese	18.0			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	4.0	U		P
7440-09-7	Potassium	5410			P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	39.0	B		P
7440-62-2	Vanadium	2.0	U		P
7440-66-6	Zinc	10.1			P
	Titanium	12.8			P

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

Comments:

9613475.1120

0000015

WO#279

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1530 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(Per Shipping Container)

Date/Time Received 3-24-94 11:00 Client Name WHC

Project/Client # SAF-065 Batch or Case # 006495

Cooler ID (if noted on the outside of cooler) SML-190

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: N/A Wet ☐ Dry ☐
6. Each sample is in a plastic bag? Yes ☑ No ☐ 3-24-94 KAA
7. Number of sample containers in cooler: ~~SML-190 - 3~~ 2
8. Samples have: ✓ tape ___ hazard labels ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ___ leaking ___ broken ___ have air bubbles ___ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 12°C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) N/A

Request for analysis #(s) 006495

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 Aeschlimann Date/Time 3-24-94 11:00

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

9613475.1121

0000016

WO#279

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1200 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(Per Shipping Container)

Date/Time Received 3-24-94 11:00 Client Name WHC

Project/Client # SAF-94-065 Batch or Case # 006492

Cooler ID (if noted on the outside of cooler) SML-555

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: N/A Wet ☐ Dry ☐
6. Each sample is in a plastic bag? Yes ☑ No ☐
7. Number of sample containers in cooler: 2
8. Samples have: ✓ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 12°C

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) N/A
    Request for analysis #(s) 006492
    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 Lahtinbueg Date/Time 3-24-94 11:00

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

9613475.1122

0000017

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1330 George Washington Way
Richland, Washington 99352

WO#279

SAMPLE CHECK-IN LIST

1 Per Shipping Container

Date/Time Received 3-24-94 11:00 Client Name WHC

Project/Client # SAF-94-065 Batch or Case # 006441

Cooler ID (if noted on the outside of cooler) SML-556

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: N/A Wet ☐ Dry ☐
6. Each sample is in a plastic bag? Yes ☑ No ☐ ~~KAT~~ 3-24-94
7. Number of sample containers in cooler: ~~SML-556 3~~ 2
8. Samples have: ✓ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 13°C

11. The following paperwork should be accounted for (N/A if not applicable):

    Chain of Custody #'(s) N/A

    Request for analysis #(s) 006441

    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 Lehtenberg Date/Time 3-24-94 11:00

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

9613475.1123

0000018

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1330 George Washington Way
Richland, Washington 99352

WO#279

SAMPLE CHECK-IN LIST

* Per Shipping Container

Date/Time Received 3-24-94 11:00 Client Name WHC

Project/Client # SAF - 94-065 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) SML 572

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

Sample temperature 9°C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) _____

Request for analysis #(s) _____

Airbill # _____ Carrier _____

12. Have any anomalies been identified above? Yes ☐ No ☐
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Karen Fektenberg Date/Time 3-24-94 11:00

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

9613475.1124

0000019

WO#279

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1550 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(Per Shipping Container)

Date/Time Received 3-24-94 11:00 Client Name WHC

Project/Client # SAF-94-065 Batch or Case # 006442

Cooler ID (if noted on the outside of cooler) SML 575

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: N/A Wet ☐ Dry ☐
6. Each sample is in a plastic bag? Yes ☑ No ☐
7. Number of sample containers in cooler: 2
8. Samples have: ✓ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 10°C

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

Printed Name/Signature Karen Hattenbury Date/Time 3/24/94 11:00

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

9613475.1125

0000020

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1550 George Washington Way
Richland, Washington 99352

WO#279

SAMPLE CHECK-IN LIST

(Per Shipping Container)

Date/Time Received 3-24-94 11:00 Client Name WHC

Project/Client # SAF 94-065 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) SML-213

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: N/A Wet ☐ Dry ☐
6. Each sample is in a plastic bag? Yes ☑ No ☐
7. Number of sample containers in cooler: 2
8. Samples have: ✓ tape ____ hazard labels ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking ____ broken ____ have air bubbles ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 8°C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) _____

Request for analysis #(s) _____

Airbill # _____ Carrier _____

12. Have any anomalies been identified above? Yes ☐ No ☐
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Karen Stottenberg Date/Time 3-24-94 11:00

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

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#279	Page 1 of 1/~~12~~ 2
		006439

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) 94-065 3/22/94
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment
Field Logbook No.
Shipped to ~~TMA~~ IT 3/21/94
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

3/29/94

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
40345 4101 BOBFM0	Veg.	03-07-94	1015	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4201 BOBFM0	Veg.	03-07-94	1015	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	[signature]
[signature]	3-24-94	0900	[signature] ITMS 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

800 CPM
3-24-94

9613475.1126

0000021

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006440

Collector R.T. Sickle
SAF No. ~~93-263~~ (Veg) 94-065 5/22/94
Ice Chest No. 125
Method of Shipment Entry
Shipped to ~~NTMA~~ IT 5/22/94
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

Company Contact C.A. Rowley
Project Designation 216-U-8 Vitrified Clay Pipeline
Bill of Lading/Airbill No. NA

Telephone 372-3293
Sampling Locations 216-U-8 Crib WO#279
Offsite Property No. NA
Field Logbook No.

SPECIAL INSTRUCTIONS

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4102	BOBFM1	Veg.	03-07-94	1015	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4202	BOBFM1	Veg.	03-07-94	1015	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
Roy T Sickle Roy T Sickle	3-15-94	1000	D S Edwards
M.A. Wilmes	3-24-94	0900	Karen Hotchkiss IT-TAS 3-24-94 1100

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

450 count CPM
KHA
3-24-94

9613475.1127

00000022

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006441

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) DRC 3/22/94 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No. 80 JEM
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment Emery
Field Logbook No.
Shipped to ~~THA~~ IT DRC 3/22/94
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4103	BOBFM2	Veg.	03-07-94	1030	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4203	BOBFM2	Veg.	03-07-94	1030	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Hottenlug FPAS 11:00 3-24-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

RHH 3-24-94 100 CPM
RHH 3-24-94

9613475.1128

0000023

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006442

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) DLC 3/22/94 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No. CWS 009
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment Energy
Field Logbook No.
Shipped to ~~Weston~~ IT DLC 3/22/94
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4104 BOBFM3	Veg.	03-07-94	1030	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4204 BOBFM3	Veg.	03-07-94	1030	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By
R.T. Sickle R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	(500)	Karen Hattenburg KHAS 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

Less than 100 cpm
3-24-94

9613475.1129

0000024

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006492

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
WO#279

SAF No. ~~93-263~~ (Veg) 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib

Ice Chest No.
Bill of Lading/Airbill No. NA
Offsite Property No. NA

Method of Shipment
Field Logbook No.

Shipped to ~~TMA~~ IT
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4105	BOBFL8	Veg.	03-07-94	0945	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4205	BOBFL8	Veg.	03-07-94	0945	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Ashtenling IT 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

3-24-94 100 cpm KAA 3-24-94

9613475.1130

0000025

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006495

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) 94-065 DJE 3/22/94
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No.
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment
Field Logbook No.
Shipped to ~~UETMA~~ IT DJE 3/22/94
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4106 BOBFL9	Veg.	03-07-94	1000	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4206 BOBFL9	Veg.	03-07-94	1000	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Holtenberg IT 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

1300 counts
~~KLL~~
3-24-94
11:00

9613475.1131

0000026

WO#520

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006459

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN2	X8	03-29-94	1022	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 11C52C401 CPL	
BOBKN2	X8	03-29-94	1022	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

4641200 1

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[illegible]	3-31-94	0815	Daniel L. Edwards
Daniel L. Edwards	4-4-94	0900	[illegible] 11:15 4-4-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1132

0000027

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#520	Page 1 of 1 006461

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN4	X8	03-29-94	1052	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 4105.2040.2 CPL	
BOBKN4	X8	03-29-94	1052	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

4412202

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
RT Sickle	3-31-94	0815	[signature]
[signature]	4-4-94	0900	[signature] ITAS 11:15 4-4-94
			<100 cpm

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1133

0000028

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#520	Page 1 of 1
		006458

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

40412003

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN1	X8	03-29-94	1015	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 40520403 CPL	
BOBKN1	X8	03-29-94	1015	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3-31-94	0815	Darrel L. Edwards
Darrel L. Edwards	4-4-94	0900	Karen Stahlberg 2100 cpm 4-4-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9413475.1134

0000029

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#520	Page 1 of 1
		006460

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN3	X S	03-29-94	1048	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 40520404 CPL	
BOBKN3	X S	03-29-94	1048	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

404/2004

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[signature] RT Sickle	3-31-94	0815	Daniel L. Edwards
Daniel L. Edwards	4-4-94	0900	[signature] ITAS 4-4-94 11:15 LAOCPMS

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1135

0000030

9613475.1136

0000031

EEG#61 ATTACHED EMERG PHONE (509) 373-3800

WO#279

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

19746

SHIPPING INST.

SHIP TO:

Company: IT

Address:

City, State, Zip: 99352

Attention:

Contractor: ☐ PNL ☐ KEH ☐ WHC

Site Carrier: N. Chase

PR No.: 200

Veh. No.:

Ship: ☐ Prepaid ☐ Collect Via:

☐ Motor-Rail ☐ Air Psgr.

☐ Excl. Use ☐ Air Cargo

☒ DOE Veh. ☐ Mail

☐ UPS Sur. ☐

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name (Radioactive Material,)	UN Number
1. Empty Packages	☐ UN 2908
2. Low Specific Activity, n.o.s	☐ UN 2912
3. Limited quantity, n.o.s.	☐ UN 2910
4. N.O.S.	☐ UN 2982
5. Fissile n.o.s.	☐ UN 2918
6. Special Form, n.o.s.	☐ UN 2974
7. Instruments & Articles	☐ UN 2911
8. [illegible]	☒ UN 2910

Material Form: ☐ Special (A1) ☒ Normal (A2)

Labels Applied: ☐ Empty ☐ Radioactive LSA ☐ White I ☐ Yellow II ☐ Yellow III ☒ None ☐ Danger (Air Cargo) ☐ Secondary

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:

Physical Form: ☒ Solid ☐ Liquid ☐ Gas

Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate

Other

TYPE PACKAGE: ☐ Strong Tight ☐ Type A ☐ Type B ☐ Type B (U) ☐ Type B (M)

CONSTRUCTION: ☐ Box, FB ☐ Wood ☐ Steel ☐ Drum ☐ Cask ☒ Other Poly-Liner

FISSILE CLASS: ☒ Non Fissile ☐ Fissile Exempt ☐ Fissile I ☐ Fissile II ☐ Fissile III

Grams Fissile

SNM: ☒ No ☐ Yes ☐ <1 gr ☐ Category I ☐ Category II ☐ Category III

ACCOUNTABILITY/SECURITY CONTROL: ☐ Classified ☒ Unclassified

Consignee authorized to receive this qty ☒

Sig. Security Svc. Reg. ☐ NA ☒

Pu, EU > 1 g ☐ N/A NU, DU > 1 Kg ☐ N/A

Security Escorts Req. ☐ Not. Req. ☒

External Cask Temperature N/A ☒ (Max. 122° F LTL, 180° F Ex. Use) °F

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes

Complies with D. O. T. packaging marking and labeling requirements ☐ N/A ☒ Yes

Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes

Container examined: No evidence of deterioration or damage ☒ Yes

QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No ☐ Yes

Shipping Doc# [illegible] 421 Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
6	[illegible]	NA		TAD applied	[illegible] - 137	<1.5 uCi	NA	35 lb/pkg
	Strong Tight	Cooler H's	SML-556, SML-555	SML-573, SML-575, SML-572				
	Empty [illegible]				SF TA-065			
	TCC H's:	CC440, CC441, CC442, CC492, CC495, CC439						
(Shipper may describe package in detail on one of unused lines above)					TOTAL	<9 uCi	NA	150 lbs

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: [illegible] Date: [illegible] Organization: [illegible] Complete Cost Code (inc. end function): [illegible] / 2T 2WA

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)

Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)

Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☐ ≤2.2 dpm α/cm²

TRUCK LOAD OR EXCLUSIVE USE: Surface: ☐ ≤ 200 mrem/hr (N + βγ) @6 feet: ☐ ≤10 mrem/hr (N + βγ) @Cab or Sleeper ☐ ≤2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

Signature - Radiation Monitoring: Bldg.: Survey No.: 61 Date: [illegible]-94

AUTHORIZATION FOR SHIPMENT

APPROVAL

AIR TRANSPORT CERTIFICATION ▸ Cargo Only: ☐ Danger Labels Applied

Passenger: ☐ 1. Ltd. Qty. ☐ 2. ≤3 T.I ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research

Pkg. Dimensions: N/A

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature ▸ M. C. Tams Printed Name ▸ M. C. TAMS Date ▸ 3-28-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B.L. No.: [illegible] 5047 Date Shipped: 3-28-94 E.T.A.: 3-28-94 Routing: WHC VEHICLE ☐ N/A

Placards: ☐ Yes ☒ No

Surveyed By: Date: Approved for Shipment Westinghouse Hanford Company: M. C. Tams Date: 3-28-94

Route Plan: ☐ Yes ☐ No

*U.S. GPO: 1992-791-064/80001

S4-6000-088 (10/88)

WO#520

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

"Yesses" are category I.
"No's" are category II.
JKN 5 Apr 94

Customer Code	Recieved Date	Recieved Time	Screening Prep Date	Screening Prep Time	Count Date	Mnts. Cntd	BACKGROUND Alpha	BACKGROUND Beta	BACKGROUND Mnts
WHC			40494		404	10	4	124	120

Customer ID	pH <2 Rcvd/Reiq	RESIDUE Wght (mGrms)	Vol. Anal. mG	Vol. Anal. mL	Sample Size Gm	Sample Size L	SMPLE CNT DATA Hldr Num.	SMPLE CNT DATA Total Alpha	SMPLE CNT DATA Counts Beta	Net Sample Counts/Minute Alpha	Net Sample Counts/Minute Beta	DPM / Aliqout Alpha	DPM / Aliqout Beta	uCi per Sample Alpha	uCi per Sample Beta	2 Sigma Error uCi per Sample Alpha	2 Sigma Error uCi per Sample Beta	pCi/(Gm or L) Alpha	pCi/(Gm or L) Beta	Catagory 1 Yes/No	Aliquot to Cat 1 Gm or Ltr Alpha	Aliquot to Cat 1 Gm or Ltr Beta
WHC/VEG.																						
B0BKN1		56.0	56		525.0		94	1	159	0.07	14.87	-2E-01	3.5E+01	-8E-04	1.5E-01	-5E-06	2.8E-05	-2E+00	2.8E+02	No	-6E+03	3.6E+02
B0BKN2		74.0	74		10.0		6	3	487	0.27	45.87	1.7E-02	1.1E+02	1.0E-06	6.7E-03	1.8E-07	4.2E-03	1.0E-01	6.7E+02	Yes	9.9E+04	1.5E+02
B0BKN3		76.5	77		625.0		10	10	736	0.97	72.77	5.0E+00	1.6E+02	1.8E-02	6.5E-01	2.2E-05	1.7E-03	2.9E+01	1.0E+03	No	3.4E+02	9.7E+01
B0BKN4		34.5	35		10.0		3	4	198	0.37	16.77	1.5E+00	4.2E+01	1.9E-04	5.4E-03	3.3E-07	2.3E-05	1.9E+01	5.4E+02	Yes	5.2E+02	1.8E+02
TOTAL	uCi									-0.03	-1.03	-1E-01	-2E+00	1.8E-02	8.1E-01	ERR	ERR	ERR	ERR	No	ERR	ERR

0000034

9613475.1137

03/11/94 13:54 ☎373 3176 2225 SB

WO #279

SAMPLE STATUS REPORT FOR E 5443. E-BLANK BOBFMO TIME: 3/ 9/94 14:29
DISPATCHED: 3/ 3/94 14: 5 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 8

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
2172	GEA-SOIL	< 6.41000E 01 pCi/gWETwt Cs-137	N	Y	VOGEL
4271	TOT-ACT	4.57000E 02 pCi/G	N	Y	VOGEL

END OF REPORT

SOCpin

03/21/94 14:36 ☎373 3176 222S 3B ☑002

WO#279

SAMPLE STATUS REPORT FOR E 5444. E-BLANK BOBFM1 TIME: 3/18/94 10:57
DISPATCHED: 3/ 3/94 14: 5 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 8

EXT.	DETER.	RESULTS OR STATUS		OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********		***	***	******
2182	GEA-V&A	4.27000E-06 pCi/G	Cs-137	N	Y	VOGEL
4271	TOT-ACT	< 5.00000E 01 pCi/G		N	Y	VOGEL

END OF REPORT

450 cpm

03/21/94 14:37 ☎373 3176 222S 3B ☑003

WO #279

SAMPLE STATUS REPORT FOR E 5445. E-BLANK B0BFM2 TIME: 3/18/94 10:57
DISPATCHED: 3/ 3/94 14: 5 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 8

EXT.	DETER.	RESULTS OR STATUS		OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********		***	***	******
2182	GEA-V&A	< 4.25000E-06 pCi/G	Cs-137	N	Y	VOGEL
4271	TOT-ACT	< 5.00000E 01 pCi/G		N	Y	VOGEL

END OF REPORT

WO#279

SAMPLE STATUS REPORT FOR E 5446. E-BLANK BOBFM3 TIME: 3/18/94 10:57
DISPATCHED: 3/ 3/94 14: 6 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 9

EXT.	DETER.	RESULTS OR STATUS		OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********		***	***	******
2182	GEA-V&A	< 3.11000E 00 pCi/G	Cs-137	N	Y	VOGEL
4271	TOT-ACT	< 5.00000E 01 pCi/G		N	Y	VOGEL

END OF REPORT

WO#279

SAMPLE STATUS REPORT FOR E 5441. E-BLANK B0BFL8 TIME: 3/ 9/94 14:29
DISPATCHED: 3/ 3/94 14: 4 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 8

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
2172	GEA-SOIL	< 2.38000E 01 pCi/gWETwt Cs-137	N	Y	VOGEL
4271	TOT-ACT	4.32000E 02 pCi/G	N	Y	VOGEL

END OF REPORT

03/11/94 13:54 ☎373 3176 222S 3B ☑004

WO#279

SAMPLE STATUS REPORT FOR E 5442. E-BLANK B0BFL9 TIME: 3/ 9/94 14:29
DISPATCHED: 3/ 3/94 14: 4 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/ 8/94 8: 8

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
2172	GEA-SOIL	< 2.71000E 01 pCi/gWETwt Cs-137	N	Y	VOGEL
4271	TOT-ACT	3.73000E 02 pCi/G	N	Y	VOGEL

END OF REPORT

320 pCi

WO#520

SAMPLE STATUS REPORT FOR E 5890. E-BLANK BOBKN2 TIME: 3/30/94 8:58
DISPATCHED: 3/29/94 8:38 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/30/94 8: 2

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	1.40000E 02 pCi/G	N	Y	VOGEL

END OF REPORT

WO#520

SAMPLE STATUS REPORT FOR E 5892. E-BLANK BOBKN4 TIME: 3/30/94 8:41
DISPATCHED: 3/29/94 8:40 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/30/94 8:30

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

WO #520

SAMPLE STATUS REPORT FOR E 5889. E-BLANK BOBKN1 TIME: 3/30/94 8:41
DISPATCHED: 3/29/94 8:37 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/30/94 8: 2

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

WO#520

SAMPLE STATUS REPORT FOR E 5891. E-BLANK BOBKN3 TIME: 3/30/94 8:58
DISPATCHED: 3/29/94 8:40 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/30/94 8: 3

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	1.70000E 02 pCi/G	N	Y	VOGEL

END OF REPORT

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: W0520 SAS No.: _____ SDG No.:BOBKN1

SOW No.: ILM02

EPA Sample No.	Lab Sample ID
BOBKN1	AA8553
BOBKN2	AA8547
BOBKN3	AA8554
BOBKN4	AA8552
BOBKN4	AA8552D
BOBKN4	AA8552S

Were ICP interelement corrections applied ? Yes/No YES

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

Comments:
For ICP analysis, samples are batched w/ QC from wo# 253.

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

Signature: Christopher Kauke Name: Christopher Kauke

Date: June 6, 1994 Title: Chemist

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN2

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1
Matrix (soil/water): SOIL Lab Sample ID: AA8547
Level (low/med): LOW Date Received: 05/12/94
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1280			P
7440-36-0	Antimony	10.0	U		P
7440-39-3	Barium	25.0	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	7780			P
7440-47-3	Chromium	2.0	U	*	P
7440-48-4	Cobalt	2.0	U		P
7440-50-8	Copper	9.7			P
7439-89-6	Iron	2730			P
7439-95-4	Magnesium	2220			P
7439-96-5	Manganese	72.1			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	4.0	U		P
7440-09-7	Potassium	4840			P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	110	B		P
7440-62-2	Vanadium	6.2	B		P
7440-66-6	Zinc	16.2			P
	Titanium	191			P

Color Before: BROWN Clarity Before: Texture: TWIGS
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN4

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8552

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1870			P
7440-36-0	Antimony	9.3	U		P
7440-39-3	Barium	34.4	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.93	U		P
7440-70-2	Calcium	10100			P
7440-47-3	Chromium	2.5		*	P
7440-48-4	Cobalt	2.0	B		P
7440-50-8	Copper	11.7			P
7439-89-6	Iron	4150			P
7439-95-4	Magnesium	2260			P
7439-96-5	Manganese	154			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	3.7	U		P
7440-09-7	Potassium	2950			P
7440-22-4	Silver	0.93	U		P
7440-23-5	Sodium	85.3	B		P
7440-62-2	Vanadium	9.2	B		P
7440-66-6	Zinc	33.3			P
	Titanium	292			P

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN1

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1
Matrix (soil/water): SOIL Lab Sample ID: AA8553
Level (low/med): LOW Date Received: 05/12/94
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	110			P
7440-36-0	Antimony	9.5	U		P
7440-39-3	Barium	7.2	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.95	U		P
7440-70-2	Calcium	2630			P
7440-47-3	Chromium	1.9	U	*	P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	5.6			P
7439-89-6	Iron	226			P
7439-95-4	Magnesium	1600			P
7439-96-5	Manganese	11.5			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	3.8	U		P
7440-09-7	Potassium	5930			P
7440-22-4	Silver	0.95	U		P
7440-23-5	Sodium	36.4	B		P
7440-62-2	Vanadium	1.9	U		P
7440-66-6	Zinc	6.9			P
	Titanium	16.8			P

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

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN3

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1
Matrix (soil/water): SOIL Lab Sample ID: AA8554
Level (low/med): LOW Date Received: 05/12/94
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	96.6			P
7440-36-0	Antimony	10.0	U		P
7440-39-3	Barium	4.4	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2710			P
7440-47-3	Chromium	2.0	U	*	P
7440-48-4	Cobalt	2.0	U		P
7440-50-8	Copper	6.0			P
7439-89-6	Iron	182			P
7439-95-4	Magnesium	1020			P
7439-96-5	Manganese	18.0			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	4.0	U		P
7440-09-7	Potassium	5410			P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	39.0	B		P
7440-62-2	Vanadium	2.0	U		P
7440-66-6	Zinc	10.1			P
	Titanium	12.8			P

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

Comments:

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 28, 1994

Attention: J.A.Lerch

SAF Number	:	94-065
Date SDG Closed	:	April 7, 1994
Number of Samples	:	Ten (10)
Sample Type	:	Vegetation
SDG Number	:	W0022
Data Deliverable	:	Stand-Alone

I. Introduction

On March 24, and April 7, 1994, ten vegetation 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
403542-01A	B0BFM0	Vegetation	3/24/94
403542-02A	B0BFM1	Vegetation	3/24/94
403542-03A	B0BFM2	Vegetation	3/24/94
403542-04A	B0BFM3	Vegetation	3/24/94
403542-05A	B0BFL8	Vegetation	3/24/94
403542-06A	B0BFL9	Vegetation	3/24/94
404120-01A	B0BKN2	Vegetation	4/7/94
404120-02A	B0BKN4	Vegetation	4/7/94
404120-03A	B0BKN1	Vegetation	4/7/94
404120-04A	B0BKN3	Vegetation	4/7/94

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II. Analytical Results/Methodology

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

The requested analyses were:

Alpha Spectroscopy
Americium-241, Curium-244 by method ITAS-RD-3302
Neptunium-237 by method ITAS-RD-3208
Plutonium-238, 239/40 by method ITAS-RD-3209
Uranium-234, 235, 238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
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
Selenium-79 by method ITAS-RD-3253
Technetium-99 by method ITAS-IT-RS-0001
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0022 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate.

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

IV. Comments

The initial radioactivity screening of the samples classified them as Category I with the exceptions of WHC samples B0BKN1 and B0BKN3 which were classified as Category II.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The LCS, batch blank, sample and sample duplicate results are within contractual requirements and are therefore acceptable.

Neptunium-237 by method ITAS-RD-3208
Two matrix spikes were analyzed with the batch and their average yield is used for yield correction. The LCS, batch blank, sample and sample duplicate results are acceptable.

Plutonium-238, -239/40 by method ITAS-RD-3209
The batch was reanalyzed due to the low yields achieved on the initial analysis. The reanalysis LCS, batch blank, sample and sample duplicate results are acceptable and reported.

Uranium-234, -235, -238 by method ITAS-RD-3234
The LCS and the batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit. The tracer yield for sample B0BFM2 did not meet the lower limit of 30%. The sample was reanalyzed and again the tracer yield was less than the 30% limit. The reanalysis LCS and batch blank are acceptable and also reported. The low tracer yield for sample B0BFM2 is attributed to a matrix effect and the reanalysis data is reported.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Due to the insufficient sample received for analysis the samples were counted for an extended count time of 1000 minutes using the maximum volume of sample available. The LCS and batch blank are within contractual requirements. Samples B0BKN2 and B0BKN4 did not meet the detection limit for Co-60, Eu-152, Eu-154, and Eu-155. The duplicate of sample B0BFL9 is within the 3 sigma control limit for all isotopes with the exception of Eu-152. The results are accepted with elevated detection limits.

Iodine-129 by method ITAS-RD-3219
The LCS and batch blank are acceptable. The following samples were recounted for extended counting times in an attempt to achieve the required detection limit: B0BKN4, B0BFM0, B0BFM3, the duplicate of B0BFL8, and B0BFL9. The detection limits were achieved on the recounts with the exception of sample B0BFL9. The recount data are accepted and reported.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The gross alpha analysis was performed in two separate sets for this SDG. In both sets the LCS, batch blank, sample and sample duplicate results are acceptable.

Gross Beta by method ITAS-RD-3222
The gross beta analysis was performed in two separate sets for this SDG. In both sets the LCS and batch blank results are acceptable. The sample and sample duplicate results were outside the 3 sigma control limit in one set and acceptable in the other set. The unacceptable sample and sample duplicate were recounted with the recount results again outside of the 3 sigma control limit. The duplicate difference could possibly be attributed to the non-homogeneous nature of vegetation matrices. The original data are accepted and reported.

Strontium-90 by method ITAS-RD-3204
The batch blank result is acceptable. The LCS radiochemical recovery is biased high (136%). The high LCS result is believed to be possible cross-contamination from the high activity of samples in the batch (batch samples have activity at levels of up to 65 times the spike level). The sample results are acceptable with the exception of sample B0BFL9 and the duplicate of B0BFM0 which did not produce results in the initial analysis due to low carrier yields. Those two samples were reanalyzed using a reduced sample size and an acceptable result was produced for B0BFL9. The duplicate of B0BFM0 had a low carrier yield on the reanalysis and a result was not produced. The reanalysis LCS and batch blank results are acceptable.

Liquid Scintillation Counting

Selenium-79 by method ITAS-RD-3253
The LCS and batch blank results are acceptable. The matrix spike result for sample B0BFM0 and the matrix spike duplicate result are acceptable and their average chemical yield is used for batch yield corrections. The sample and sample duplicate results are within the 3 sigma control limit.

Technetium-99 by method ITAS-IT-RS-0001
An error in sample batching caused samples B0BKN2 and B0BKN4 to be batched with SDGs W0032 and W0033. The LCS, matrix spikes, batch blank, sample and sample duplicate results associated with these two samples are acceptable and reported. The sample results were not yield corrected by the matrix spike recoveries.

The results for the remaining samples in SDG W0022 analyzed separately from B0BKN2 and B0BKN4 are also acceptable. Two matrix spikes were analyzed with this set. The sample results were not yield corrected by the matrix spike recoveries. One matrix spike is not reported due to technician error during the sample preparation. The technician reported that the spike foamed profusely when peroxide was added to the beaker during the wet ashing step of the sample preparation. A significant quantity of the spike poured out of the beaker. The other matrix spike analyzed with the set is biased high (139%) due to the activity of the sample and the effect of the sample's activity on counting statistics. The spike level added was 67 pCi/g and the sample activity measured 300 pCi/g. The LCS, batch blank, sample and sample duplicate results are within contractual requirements and reported.

Total Uranium

Total Uranium by method ITAS-RD-4200
The LCS, batch blank, sample and sample duplicate results are acceptable. Two matrix spikes were analyzed with the batch and their average yield is used for yield correcting the sample results.

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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

9613475.1159

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-01 MATRIX: VEGETATION

WHC ID: BOBFM0 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	4.73E-03	1.03E-02	1.03E-02	0.64	RD3302
CM-242	-5.73E-04	1.15E-03	1.15E-03	0.64	RD3302
CM-244	-1.24E-03	1.44E-03	1.45E-03	0.64	RD3302
NP-237	4.62E-03	9.23E-03	9.29E-03	0.832	RD3208
PU239/40	2.28E-02	2.28E-02	2.31E-02	0.712	RD3209
PU-238	-2.29E-03	3.24E-03	3.25E-03	0.712	RD3209
U-234	3.24E-01	1.00E-01	1.11E-01	0.518	RD3234
U-235	1.40E-02	2.16E-02	2.17E-02	0.518	RD3234
U-238DA	2.29E-01	8.35E-02	9.00E-02	0.518	RD3234
CS-134	3.61E-03	1.53E-02	1.53E-02	N/A	RD3219
CS-137DA	1.72E+01	1.34E-01	1.73E+00	N/A	RD3219
CO-60	3.85E-03	9.60E-03	9.61E-03	N/A	RD3219
K-40	3.76E+00	3.36E-01	5.04E-01	N/A	RD3219
EU-152	8.52E-03	4.81E-02	4.81E-02	N/A	RD3219
EU-154	-2.25E-02	3.18E-02	3.19E-02	N/A	RD3219
EU-155	2.03E-02	7.99E-02	7.99E-02	N/A	RD3219
RU-106DA	-1.24E-01	1.64E-01	1.64E-01	N/A	RD3219
RA-224DA	6.86E-02	4.38E-02	4.43E-02	N/A	RD3219
NA-22	-8.27E-03	1.17E-02	1.17E-02	N/A	RD3219
BE-7	2.30E+00	7.39E-01	7.73E-01	N/A	RD3219
PB-212	6.43E-02	4.10E-02	4.15E-02	N/A	RD3219
TH-232DA	1.52E-01	6.34E-02	6.52E-02	N/A	RD3219
I-129LP	-4.94E-01	1.06E+00	1.07E+00	N/A	RD3219
ALPHA	3.35E+00	2.94E+00	2.96E+00	1	RD3222
BETA	8.79E+02	1.92E+01	6.11E+01	1	RD3222
TOTAL-SR	4.92E+02	6.58E+00	1.13E+02	0.593	RD3204
SE-79	1.44E+00	5.72E-01	1.59E+00	0.772	RD3253
TC-99	4.95E+01	7.60E-01	6.08E+00	0.951	ITAS-IT-RS-0001
URANIUM	7.82E-01	N/A	1.17E-01	0.781	RD4200

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-02 MATRIX: VEGETATION

WHC ID: BOBFM1 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	-9.12E-04	1.29E-03	1.30E-03	0.59	RD3302
CM-242	0.00E+00	0.00E+00	2.38E-02	0.59	RD3302
CM-244	-4.60E-04	9.19E-04	9.22E-04	0.59	RD3302
NP-237	0.00E+00	0.00E+00	0.00E+00	0.832	RD3208
PU239/40	1.11E-02	1.58E-02	1.58E-02	0.76	RD3209
PU-238	1.12E-02	1.58E-02	1.59E-02	0.76	RD3209
U-234	1.86E-01	8.91E-02	9.39E-02	0.393	RD3234
U-235	6.29E-03	2.13E-02	2.13E-02	0.393	RD3234
U-238DA	1.45E-01	7.85E-02	8.19E-02	0.393	RD3234
K-40	3.43E+00	3.92E-01	5.21E-01	N/A	RD3219
CO-60	1.13E-02	1.13E-02	1.14E-02	N/A	RD3219
EU-152	9.58E-02	5.61E-02	5.69E-02	N/A	RD3219
CS-137DA	6.32E+00	8.36E-02	6.38E-01	N/A	RD3219
CS-134	-1.02E-02	1.35E-02	1.35E-02	N/A	RD3219
RU-106DA	-6.16E-02	1.43E-01	1.43E-01	N/A	RD3219
RA-224DA	4.94E-02	4.41E-02	4.43E-02	N/A	RD3219
NA-22	1.22E-02	1.17E-02	1.18E-02	N/A	RD3219
EU-155	9.52E-03	6.98E-02	6.98E-02	N/A	RD3219
BE-7	2.21E+00	6.54E-01	6.90E-01	N/A	RD3219
EU-154	3.32E-02	3.18E-02	3.20E-02	N/A	RD3219
TL-208	3.70E-02	1.96E-02	1.99E-02	N/A	RD3219
PB-212	4.63E-02	4.13E-02	4.15E-02	N/A	RD3219
TH-232DA	1.18E-01	5.05E-02	5.19E-02	N/A	RD3219
I-129LP	-1.23E+00	1.25E+00	1.26E+00	N/A	RD3219
ALPHA	-5.43E-01	1.09E+00	1.09E+00	1	RD3222
BETA	6.14E+02	1.61E+01	4.36E+01	1	RD3222
TOTAL-SR	4.26E+02	2.97E+00	9.49E+01	0.487	RD3204
SE-79	1.85E+00	6.04E-01	1.71E+00	0.772	RD3253
TC-99	4.68E+01	7.42E-01	5.79E+00	0.951	ITAS-IT-RS-0001
URANIUM	6.13E-01	N/A	9.19E-02	0.781	RD4200

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-03 MATRIX: VEGETATION

WHC ID: BOBFM2 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	9.78E-03	1.38E-02	1.39E-02	0.67	RD3302
CM-242	0.00E+00	0.00E+00	2.04E-02	0.67	RD3302
CM-244	4.93E-03	9.85E-03	9.89E-03	0.67	RD3202
NP-237	4.94E-03	9.87E-03	9.93E-03	0.832	RD3208
PU239/40	2.39E-02	2.39E-02	2.42E-02	0.667	RD3209
PU-238	-2.39E-03	3.39E-03	3.41E-03	0.667	RD3209
U-234	1.17E-02	3.11E-02	3.11E-02	0.278	RD3234
U-235	-4.92E-03	4.92E-03	5.00E-03	0.278	RD3234
U-238DA	7.20E-02	6.89E-02	7.02E-02	0.278	RD3234
K-40	5.29E+00	4.87E-01	7.19E-01	N/A	RD3219
CO-60	1.10E-02	1.19E-02	1.20E-02	N/A	RD3219
EU-152	2.09E-02	5.67E-02	5.67E-02	N/A	RD3219
CS-137DA	5.79E-01	3.01E-02	6.53E-02	N/A	RD3219
CS-134	-3.65E-03	1.12E-02	1.12E-02	N/A	RD3219
RU-106DA	1.21E-01	1.01E-01	1.02E-01	N/A	RD3219
NA-22	-5.87E-03	1.44E-02	1.44E-02	N/A	RD3219
EU-155	1.12E-02	2.62E-02	2.62E-02	N/A	RD3219
BE-7	2.02E+00	3.87E-01	4.36E-01	N/A	RD3219
EU-154	-1.60E-02	3.91E-02	3.91E-02	N/A	RD3219
AC-228	4.14E-02	7.80E-02	7.81E-02	N/A	RD3219
U-238DA	1.34E-01	4.27E-02	4.47E-02	N/A	RD3219
PB-212	4.51E-02	3.11E-02	3.14E-02	N/A	RD3219
PB-214	1.34E-01	4.27E-02	4.47E-02	N/A	RD3219
RA-228DA	4.23E-02	7.97E-02	7.98E-02	N/A	RD3219
I-129LP	-7.08E-02	3.61E-01	3.61E-01	N/A	RD3219
ALPHA	2.71E-01	2.19E+00	2.19E+00	1	RD3222
BETA	2.48E+01	3.54E+00	3.90E+00	1	RD3222
TOTAL-SR	1.04E+01	4.16E-01	2.45E+00	0.628	RD3204
SE-79	4.90E-01	5.80E-01	1.56E+00	0.772	RD3253
TC-99	2.94E+01	6.09E-01	3.95E+00	0.951	ITAS-IT-RS-0001
URANIUM	1.26E-01	N/A	1.89E-02	0.781	RD4200

9613475.1162

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-04 MATRIX: VEGETATION

WHC ID: BOBFM3 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	1.30E-02	1.92E-02	1.94E-02	0.524	RD3302
CM-242	-1.51E-03	2.14E-03	2.16E-03	0.524	RD3302
CM-244	0.00E+00	0.00E+00	2.05E-02	0.524	RD3202
NP-237	4.62E-03	9.23E-03	9.29E-03	0.832	RD3208
PU239/40	1.61E-02	2.05E-02	2.06E-02	0.815	RD3209
PU-238	9.04E-03	1.44E-02	1.44E-02	0.815	RD3209
U-234	8.00E-02	5.97E-02	6.11E-02	0.398	RD3234
U-235	-2.53E-03	2.92E-03	2.95E-03	0.398	RD3234
U-238DA	5.01E-02	4.72E-02	4.79E-02	0.398	RD3234
K-40	3.58E+00	3.94E-01	5.32E-01	N/A	RD3219
CO-60	1.27E-02	9.55E-03	9.63E-03	N/A	RD3219
EU-152	5.82E-02	5.16E-02	5.19E-02	N/A	RD3219
CS-137DA	6.11E-01	2.96E-02	6.79E-02	N/A	RD3219
CS-134	-2.99E-03	9.51E-03	9.51E-03	N/A	RD3219
RU-106DA	1.15E-01	8.77E-02	8.84E-02	N/A	RD3219
RA-224DA	4.79E-02	3.27E-02	3.30E-02	N/A	RD3219
NA-22	-5.85E-03	1.17E-02	1.17E-02	N/A	RD3219
EU-155	-4.48E-03	2.58E-02	2.58E-02	N/A	RD3219
TH-234	2.63E+00	1.22E+01	1.22E+01	N/A	RD3219
BE-7	2.61E+00	3.42E-01	4.30E-01	N/A	RD3219
EU-154	-1.59E-02	3.18E-02	3.19E-02	N/A	RD3219
TL-208	7.74E-03	1.95E-02	1.95E-02	N/A	RD3219
PB-212	4.48E-02	3.06E-02	3.09E-02	N/A	RD3219
I-129LP	9.38E-02	2.76E-01	2.77E-01	N/A	RD3219
ALPHA	-4.52E-01	2.02E+00	2.02E+00	1	RD3222
BETA	3.54E+01	4.16E+00	4.77E+00	1	RD3222
TOTAL-SR	1.00E+01	3.81E-01	2.42E+00	0.747	RD3204
SE-79	5.08E-01	5.73E-01	1.55E+00	0.772	RD3253
TC-99	2.87E+01	6.08E-01	3.88E+00	0.951	ITAS-IT-RS-0001
URANIUM	1.06E-01	N/A	1.58E-02	0.781	RD4200

682A-6-93

9613475.1163

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-05 MATRIX: VEGETATION

WHC ID: BOBFL8 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	7.34E-03	1.47E-02	1.47E-02	0.463	RD3302
CM-242	0.00E+00	0.00E+00	3.07E-02	0.463	RD3302
CM-244	0.00E+00	0.00E+00	2.22E-02	0.463	RD3202
NP-237	-3.66E-04	7.32E-04	7.36E-04	0.832	RD3208
PU239/40	2.35E-02	2.49E-02	2.51E-02	0.68	RD3209
PU-238	0.00E+00	0.00E+00	1.86E-02	0.68	RD3209
U-234	5.54E-02	4.17E-02	4.25E-02	0.517	RD3234
U-235	-2.94E-03	2.63E-03	2.67E-03	0.517	RD3234
U-238DA	4.74E-02	3.91E-02	3.97E-02	0.517	RD3234
K-40	9.28E+00	4.35E-01	1.03E+00	N/A	RD3219
CO-60	8.47E-03	1.12E-02	1.12E-02	N/A	RD3219
EU-152	8.00E-02	4.26E-02	4.34E-02	N/A	RD3219
CS-137DA	1.58E-01	2.12E-02	2.65E-02	N/A	RD3219
CS-134	-3.68E-04	1.05E-02	1.05E-02	N/A	RD3219
RU-106DA	8.98E-03	1.08E-01	1.08E-01	N/A	RD3219
NA-22	-2.58E-03	1.22E-02	1.22E-02	N/A	RD3219
EU-155	5.31E-02	6.29E-02	6.31E-02	N/A	RD3219
PB-212	2.40E-02	3.50E-02	3.51E-02	N/A	RD3219
BE-7	1.89E+00	3.74E-01	4.19E-01	N/A	RD3219
EU-154	-7.01E-03	3.31E-02	3.31E-02	N/A	RD3219
I-129LP	-3.52E-01	1.17E+00	1.17E+00	N/A	RD3219
ALPHA	5.42E-01	2.17E+00	2.17E+00	1	RD3222
BETA	8.17E+02	1.85E+01	5.70E+01	1	RD3222
TOTAL-SR	3.28E+02	2.04E+00	8.11E+01	0.868	RD3204
SE-79	6.70E-01	6.02E-01	1.62E+00	0.772	RD3253
TC-99	2.96E+02	1.77E+00	3.24E+01	0.951	ITAS-IT-RS-0001
URANIUM	2.09E-01	N/A	3.13E-02	0.781	RD4200

682A-8-93

9613475.1164

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-06 MATRIX: VEGETATION

WHC ID: BOBFL9 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	9.31E-03	1.44E-02	1.44E-02	0.665	RD3302
CM-242	0.00E+00	0.00E+00	2.11E-02	0.665	RD3302
CM-244	0.00E+00	0.00E+00	1.53E-02	0.665	RD3202
NP-237	8.55E-03	1.26E-02	1.28E-02	0.832	RD3208
PU239/40	7.08E-02	5.01E-02	5.15E-02	0.459	RD3209
PU-238	-3.55E-03	5.01E-03	5.05E-03	0.459	RD3209
U-234	1.98E-01	7.42E-02	7.93E-02	0.57	RD3234
U-235	5.68E-03	1.36E-02	1.36E-02	0.57	RD3234
U-238DA	1.89E-01	7.16E-02	7.64E-02	0.57	RD3234
K-40	5.37E+00	4.09E-01	6.75E-01	N/A	RD3219
CO-60	6.98E-03	1.11E-02	1.11E-02	N/A	RD3219
EU-152	2.20E-02	5.11E-02	5.11E-02	N/A	RD3219
CS-137DA	9.74E-01	4.58E-02	1.08E-01	N/A	RD3219
CS-134	-4.47E-03	1.63E-02	1.63E-02	N/A	RD3219
RU-106DA	-6.97E-02	1.66E-01	1.66E-01	N/A	RD3219
RA-224DA	2.34E-01	6.77E-02	7.17E-02	N/A	RD3219
NA-22	3.09E-03	1.22E-02	1.22E-02	N/A	RD3219
EU-155	-5.67E-03	1.42E-01	1.42E-01	N/A	RD3219
U-238DA	1.93E-01	6.98E-02	7.24E-02	N/A	RD3219
BE-7	2.70E+00	5.37E-01	6.01E-01	N/A	RD3219
EU-154	1.28E-02	3.30E-02	3.30E-02	N/A	RD3219
TL-208	4.25E-02	3.53E-02	3.55E-02	N/A	RD3219
PB-212	2.19E-01	6.33E-02	6.70E-02	N/A	RD3219
PB-214	1.93E-01	6.98E-02	7.24E-02	N/A	RD3219
TH-232DA	1.85E-01	8.70E-02	8.90E-02	N/A	RD3219
I-129LP	1.19E+00	2.32E+00	2.32E+00	N/A	RD3219
ALPHA	1.09E+00	2.13E+00	2.13E+00	1	RD3222
BETA	4.22E+03	4.20E+01	2.82E+02	1	RD3222
TOTAL-SR	1.38E+03	1.01E+01	3.47E+02	0.921	RD3204
SE-79	2.66E+00	6.36E-01	1.83E+00	0.772	RD3253
TC-99	1.17E+02	1.16E+00	1.33E+01	0.951	ITAS-IT-RS-0001
URANIUM	7.52E-01	N/A	1.13E-01	0.781	RD4200

682A-6-93

9613475.1165

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-01 MATRIX: VEGETATION

WHC ID: BOBKN2 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	2.02E-02	2.02E-02	2.05E-02	0.695	RD3302
CM-242	0.00E+00	0.00E+00	1.92E-02	0.695	RD3302
CM-244	-4.06E-04	8.12E-04	8.15E-04	0.695	RD3202
NP-237	0.00E+00	0.00E+00	0.00E+00	0.832	RD3208
PU239/40	7.48E-02	4.32E-02	4.46E-02	0.643	RD3209
PU-238	3.74E-03	1.30E-02	1.30E-02	0.643	RD3209
U-234	1.04E-01	6.89E-02	7.10E-02	0.376	RD3234
U-235	8.70E-03	2.08E-02	2.09E-02	0.376	RD3234
U-238DA	1.34E-01	7.47E-02	7.79E-02	0.376	RD3234
K-40	6.78E+00	1.33E+00	1.49E+00	N/A	RD3219
CO-60	-3.27E-02	4.10E-02	4.11E-02	N/A	RD3219
EU-152	2.84E-01	1.72E-01	1.74E-01	N/A	RD3219
CS-137DA	1.67E+00	1.00E-01	1.95E-01	N/A	RD3219
CS-134	2.55E-02	3.88E-02	3.88E-02	N/A	RD3219
RU-106DA	-9.44E-02	3.69E-01	3.69E-01	N/A	RD3219
RA-224DA	2.68E-01	1.43E-01	1.46E-01	N/A	RD3219
NA-22	-1.20E-02	4.56E-02	4.56E-02	N/A	RD3219
EU-155	7.25E-02	1.43E-01	1.43E-01	N/A	RD3219
U-238DA	4.71E-01	1.53E-01	1.60E-01	N/A	RD3219
EU-154	-3.32E-02	1.26E-01	1.26E-01	N/A	RD3219
TL-208	1.65E-01	6.36E-02	6.57E-02	N/A	RD3219
PB-212	2.57E-01	1.38E-01	1.40E-01	N/A	RD3219
PB-214	4.71E-01	1.53E-01	1.60E-01	N/A	RD3219
TH-232DA	4.64E-01	1.96E-01	2.02E-01	N/A	RD3219
I-129LP	-3.62E-02	1.17E+00	1.17E+00	N/A	RD3219
ALPHA	7.42E+00	4.00E+00	4.08E+00	1	RD3222
BETA	2.35E+02	1.00E+01	1.85E+01	1	RD3222
TOTAL-SR	2.95E+02	2.45E+00	6.60E+01	0.493	RD3204
SE-79	9.29E-02	5.23E-01	1.39E+00	0.772	RD3253
TC-99	2.35E+01	6.33E-01	3.31E+00	0.951	ITAS-IT-RS-0001
URANIUM	5.31E-01	N/A	7.97E-02	0.781	RD4200

682A-6-93

9613475.1166

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-02 MATRIX: VEGETATION

WHC ID: BOBKN4 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	3.53E-02	3.38E-02	3.44E-02	0.459	RD3302
CM-242	-7.65E-04	1.53E-03	1.54E-03	0.459	RD3302
CM-244	-6.07E-04	1.21E-03	1.22E-03	0.459	RD3202
NP-237	1.02E-02	1.44E-02	1.46E-02	0.832	RD3208
PU239/40	3.56E-02	3.07E-02	3.11E-02	0.73	RD3209
PU-238	-1.15E-03	2.30E-03	2.30E-03	0.73	RD3209
U-234	2.55E-01	1.16E-01	1.25E-01	0.316	RD3234
U-235	-4.16E-03	4.16E-03	4.22E-03	0.316	RD3234
U-238DA	1.91E-01	1.01E-01	1.06E-01	0.316	RD3234
K-40	5.27E+00	1.52E+00	1.61E+00	N/A	RD3219
CO-60	-1.55E-02	4.57E-02	4.57E-02	N/A	RD3219
EU-152	2.29E-01	1.69E-01	1.70E-01	N/A	RD3219
CS-137DA	1.11E+00	9.92E-02	1.49E-01	N/A	RD3219
CS-134	1.47E-02	4.23E-02	4.23E-02	N/A	RD3219
RU-106DA	-2.05E-01	4.32E-01	4.33E-01	N/A	RD3219
RA-224DA	3.01E-01	1.32E-01	1.36E-01	N/A	RD3219
NA-22	5.92E-03	4.15E-02	4.15E-02	N/A	RD3219
EU-155	7.56E-02	1.67E-01	1.68E-01	N/A	RD3219
TH-234	1.84E+01	2.30E+01	2.31E+01	N/A	RD3219
BE-7	1.80E+00	8.79E-01	8.98E-01	N/A	RD3219
EU-154	1.63E-02	1.14E-01	1.14E-01	N/A	RD3219
PB-212	2.89E-01	1.27E-01	1.31E-01	N/A	RD3219
I-129LP	2.97E-02	1.02E+00	1.02E+00	N/A	RD3219
ALPHA	5.88E+00	3.69E+00	3.74E+00	1	RD3222
BETA	4.17E+02	1.33E+01	3.05E+01	1	RD3222
TOTAL-SR	4.91E+02	3.20E+00	1.09E+02	0.475	RD3204
SE-79	5.98E-01	5.49E-01	1.49E+00	0.772	RD3253
TC-99	4.55E+01	8.36E-01	5.62E+00	0.951	ITAS-IT-RS-0001
URANIUM	4.68E-01	N/A	7.02E-02	0.781	RD4200

682A-6-93

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-03 MATRIX: VEGETATION

WHC ID: BOBKN1 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	-4.67E-04	9.34E-04	9.37E-04	0.613	RD3302
CM-242	-5.92E-04	1.19E-03	1.19E-03	0.613	RD3302
CM-244	-1.41E-03	1.63E-03	1.64E-03	0.613	RD3202
NP-237	4.39E-03	8.79E-03	8.84E-03	0.832	RD3208
PU239/40	9.04E-03	1.44E-02	1.44E-02	0.842	RD3209
PU-238	5.03E-03	1.01E-02	1.01E-02	0.842	RD3209
U-234	4.84E-02	4.13E-02	4.19E-02	0.477	RD3234
U-235	-2.02E-03	2.33E-03	2.35E-03	0.477	RD3234
U-238DA	2.46E-02	2.92E-02	2.94E-02	0.477	RD3234
K-40	6.37E+00	4.79E-01	7.97E-01	N/A	RD3219
CO-60	2.26E-02	1.34E-02	1.36E-02	N/A	RD3219
EU-152	-1.52E-03	5.63E-02	5.63E-02	N/A	RD3219
CS-137DA	1.18E-01	2.46E-02	2.73E-02	N/A	RD3219
CS-134	-3.47E-03	1.01E-02	1.01E-02	N/A	RD3219
RU-106DA	5.92E-02	1.03E-01	1.03E-01	N/A	RD3219
RA-224DA	4.46E-02	3.04E-02	3.07E-02	N/A	RD3219
NA-22	-1.86E-03	1.45E-02	1.45E-02	N/A	RD3219
EU-155	1.78E-02	3.42E-02	3.42E-02	N/A	RD3219
BE-7	1.57E+00	2.55E-01	2.99E-01	N/A	RD3219
EU-154	-5.11E-03	3.99E-02	3.99E-02	N/A	RD3219
TL-208	1.06E-02	2.54E-02	2.54E-02	N/A	RD3219
PB-212	4.28E-02	2.91E-02	2.94E-02	N/A	RD3219
TH-232DA	4.46E-02	8.51E-02	8.52E-02	N/A	RD3219
I-129LP	1.47E-01	5.77E-01	5.77E-01	N/A	RD3219
ALPHA	-5.43E-01	1.09E+00	1.09E+00	1	RD3222
BETA	1.17E+02	7.17E+00	1.06E+01	1	RD3222
TOTAL-SR	5.23E+02	2.78E+00	1.24E+02	0.705	RD3204
SE-79	6.68E-01	5.85E-01	1.58E+00	0.772	RD3253
TC-99	5.34E+00	3.54E-01	1.52E+00	0.951	ITAS-IT-RS-0001
URANIUM	6.38E-02	N/A	9.60E-03	0.781	RD4200

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-04 MATRIX: VEGETATION

WHC ID: BOBKN3 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	2.11E-02	2.16E-02	2.19E-02	0.616	RD3302
CM-242	-5.47E-04	1.09E-03	1.10E-03	0.616	RD3302
CM-244	-8.67E-04	1.23E-03	1.23E-03	0.616	RD3202
NP-237	0.00E+00	0.00E+00	0.00E+00	0.832	RD3208
PU239/40	4.99E-03	9.97E-03	1.00E-02	0.807	RD3209
PU-238	-2.00E-03	2.82E-03	2.84E-03	0.807	RD3209
U-234	4.91E-02	3.80E-02	3.86E-02	0.561	RD3234
U-235	-2.30E-03	2.30E-03	2.32E-03	0.561	RD3234
U-238DA	6.29E-02	4.31E-02	4.40E-02	0.561	RD3234
K-40	6.65E+00	4.94E-01	8.28E-01	N/A	RD3219
CO-60	1.20E-02	1.24E-02	1.25E-02	N/A	RD3219
EU-152	7.66E-02	5.32E-02	5.37E-02	N/A	RD3219
CS-137DA	7.23E-02	2.71E-02	2.80E-02	N/A	RD3219
CS-134	-3.63E-03	1.27E-02	1.27E-02	N/A	RD3219
RU-106DA	9.20E-02	1.23E-01	1.24E-01	N/A	RD3219
RA-224DA	1.33E-02	4.17E-02	4.17E-02	N/A	RD3219
NA-22	-2.96E-03	1.28E-02	1.28E-02	N/A	RD3219
EU-155	-2.97E-02	7.70E-02	7.71E-02	N/A	RD3219
BE-7	2.58E+00	3.36E-01	4.24E-01	N/A	RD3219
EU-154	-8.14E-03	3.51E-02	3.51E-02	N/A	RD3219
TL-208	9.33E-03	2.60E-02	2.61E-02	N/A	RD3219
PB-212	1.28E-02	3.99E-02	4.00E-02	N/A	RD3219
I-129LP	-3.33E-01	3.99E-01	4.00E-01	N/A	RD3219
ALPHA	2.08E+00	2.84E+00	2.85E+00	1	RD3222
BETA	7.21E+02	1.74E+01	5.06E+01	1	RD3222
TOTAL-SR	6.69E+01	9.25E-01	1.64E+01	0.841	RD3204
SE-79	1.21E+00	5.78E-01	1.59E+00	0.772	RD3253
TC-99	3.61E+01	6.70E-01	4.66E+00	0.951	ITAS-IT-RS-0001
URANIUM	1.56E-01	N/A	2.34E-02	0.781	RD4200

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W0022-ITC-035

MEMORANDUM

JUN 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record June 15, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0022-ITC-035 (923-E418, Filename W0022M.UP2)

INTRODUCTION

This memo presents the results of data validation on data package W0022-ITC-035 prepared by the International Technology Corporation (ITC) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BFL8	03/07/94	VEGETATION	SEE NOTE 1
B0BFL9	03/07/94	VEGETATION	
B0BFM0	03/07/94	VEGETATION	
B0BFM1	03/07/94	VEGETATION	
B0BFM2	03/07/94	VEGETATION	
B0BFM3	03/07/94	VEGETATION	
B0BKN1	03/29/94	VEGETATION	
B0BKN2	03/29/94	VEGETATION	
B0BKN3	03/29/94	VEGETATION	
B0BKN4	03/29/94	VEGETATION	

RECEIVED JUN 16 1994 VALIDATION DOCUMENTATION SDLA

Note 1. All samples were analyzed for CLP TAL metals and titanium except samples B0BKN1, B0BKN2, B0BKN3, and B0BKN4 which were not analyzed for graphite furnace metals due to limited sample amounts.

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

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiencies identified below.

001

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

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses with the exception of the graphite furnace data for samples B0BKN1, B0BKN2, B0BKN3, and B0BKN4. This was due to insufficient sample amounts and therefore the analyses for arsenic, lead, selenium and thallium were not performed.

A total of ten samples were validated in this data package with a total of 224 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, 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 data validation which required qualification of data as estimated.

Holding Times

- The required holding time for mercury was exceeded. Attachments 2 and 5 provide a summary of the affected samples, qualifications applied and supporting documentation.

Laboratory Blanks

- Aluminum, sodium, zinc, and silver were detected at positive concentrations in the associated calibration or preparation blanks. Attachments 2 and 5 provide a summary of the affected samples, qualifications applied and supporting documentation.

Matrix Spikes

- Matrix spike percent recoveries for arsenic was unacceptable. Attachments 2 and 5 provide a summary of the affected samples, qualifications applied and supporting documentation.

GFAA Analytical Spikes

- GFAA analytical spike recoveries for arsenic were unacceptable. Attachments 2 and 5 provide a summary of the data qualifications applied and supporting documentation.

9613175.1171

REFERENCES

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

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

9613476.1172

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: W0022-ITC-035	VALIDATOR: [illegible]	DATE: June 13, 1994	PAGE 1 OF 1
COMMENTS: METALS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
MERCURY	UJ	B0BFM0 B0BFM1 B0BFM2 B0BFM3 B0BFL8 B0BFL9 B0BKN1 B0BKN2 B0BKN3 B0BKN4	ANALYZED OUT OF REQUIRED HOLDING TIME
ALUMINUM	U	B0BFL9	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
SODIUM	U	B0BFM0 B0BFM1 B0BFM3 B0BFL8 B0BFL9 B0BKN1 B0BKN2 B0BKN3 B0BKN4	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
ZINC	U	B0BFM1 B0BFM3 B0BFL8 B0BFL9 B0BKN1	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
SILVER	U	B0BFL9	PRESENT IN ASSOCIATED CCB AT A POSITIVE CONCENTRATION
ARSENIC	UJ	B0BFM0 B0BFM1 B0BFM2 B0BFM3 B0BFL8 B0BFL9	MS %R < 75% BUT > 30%
ARSENIC	UJ	B0BFM0 B0BFM1 B0BFM2 B0BFM3 B0BFL8 B0BFL9	GFAA ANALYTICAL SPIKE %R < 85% BUT > 40%

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0022-ITC-035

	Samp#	BOBFL8		BOBFL9		BOBFM0		BOBFM1		BOBFM2		BOBFM3	
	Date	3-7-94		3-7-94		3-7-94		3-7-94		3-7-94		3-7-94	
	Location	216-U-8		216-U-8		216-U-8		216-U-8		216-U-8		216-U-8	
	Depth	---		---		---		---		---		---	
	Type	VEGETATION		VEGETATION		VEGETATION		VEGETATION		VEGETATION		VEGETATION	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	192.000		157.000	U	419.000		578.000		226.000		274.000	
ANTIMONY	MG/KG	11.600	B	10.200	U	15.800		10.400	U	11.100	U	12.300	B
ARSENIC	MG/KG	0.420	UJ	0.420	UJ	0.430	UJ	0.410	UJ	0.420	UJ	0.440	UJ
BARIUM	MG/KG	27.300	B	33.900	B	18.900	B	27.700	B	22.300	B	19.900	B
BERYLLIUM	MG/KG	0.220	U	0.200	U	0.210	U	0.210	U	0.220	U	0.220	U
CADMIUM	MG/KG	1.100	U	1.000	U	1.100	U	1.000	U	1.100	U	1.100	U
CALCIUM	MG/KG	21400.000		28900.000		19900.000		20800.000		15400.000		15600.000	
CHROMIUM	MG/KG	2.200	U	2.000	U	2.100	U	2.100	U	2.200	U	2.200	U
COBALT	MG/KG	2.200	U	2.000	U	2.100	U	2.100	U	2.200	U	2.200	U
COPPER	MG/KG	6.200		7.600		6.900		4.100	B	12.200		7.900	
IRON	MG/KG	278.000		298.000		830.000		1110.000		433.000		534.000	
LEAD	MG/KG	0.470	B	0.420	U	0.750		0.700		1.000		0.550	B
MAGNESIUM	MG/KG	5990.000		8160.000		4510.000		3470.000		4530.000		5850.000	
MANGANESE	MG/KG	25.700		41.600		59.500		48.200		37.100		41.300	
MERCURY	MG/KG	0.100	UJ	0.100	UJ	0.100	UJ	0.100	UJ	0.110	UJ	0.100	UJ
NICKEL	MG/KG	4.500	U	4.100	U	4.300	U	4.200	U	4.400	U	4.300	U
POTASSIUM	MG/KG	4140.000		4740.000		1740.000		1130.000		8390.000		5360.000	
SELENIUM	MG/KG	0.420	U	0.420	U	0.430	U	0.410	U	0.420	U	0.440	U
SILVER	MG/KG	1.100	U	1.100	U	1.100	U	1.000	U	1.100	U	1.100	U
SODIUM	MG/KG	110.000	U	129.000	U	71.600	U	75.600	U	161.000	B	77.100	U
THALLIUM	MG/KG	0.420	U	0.420	U	0.430	U	0.410	U	0.420	U	0.440	U
VANADIUM	MG/KG	2.200	U	2.000	U	2.100	U	2.900	B	2.200	U	2.200	U
ZINC	MG/KG	8.400	U	9.700	U	34.000		11.000	U	20.400		12.000	U
TITANIUM	MG/KG	19.100		19.700		57.400		80.900		32.300		40.200	

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Validated Data Summary, Data Package: W0022-ITC-035

	Samp#	BOBKN1		BOBKN2		BOBKN3		BOBKN4	
	Date	3-29-94		3-29-94		3-29-94		3-29-94	
	Location	216-U-8		216-U-8		216-U-8		216-U-8	
	Depth	---		---		---		---	
	Type	VEGETATION		VEGETATION		VEGETATION		VEGETATION	
	Comments	---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	MG/KG	110.000		1280.000		96.600		1870.000	
ANTIMONY	MG/KG	9.500	U	10.000	U	10.000	U	9.300	U
ARSENIC	MG/KG	---		---		---		---	
BARIUM	MG/KG	7.200	B	25.000	B	4.400	B	34.400	B
BERYLLIUM	MG/KG	0.190	U	0.200	U	0.200	U	0.190	U
CADMIUM	MG/KG	0.950	U	1.000	U	1.000	U	0.930	U
CALCIUM	MG/KG	2630.000		7780.000		2710.000		10100.000	
CHROMIUM	MG/KG	1.900	U	2.000	U	2.000	U	2.500	
COBALT	MG/KG	1.900	U	2.000	U	2.000	U	2.000	B
COPPER	MG/KG	5.600		9.700		6.000		11.700	
IRON	MG/KG	226.000		2730.000		182.000		4150.000	
LEAD	MG/KG	---		---		---		---	
MAGNESIUM	MG/KG	1600.000		2220.000		1020.000		2260.000	
MANGANESE	MG/KG	11.500		72.100		18.000		154.000	
MERCURY	MG/KG	0.090	UJ	0.100	UJ	0.090	UJ	0.090	UJ
NICKEL	MG/KG	3.800	U	4.000	U	4.000	U	3.700	U
POTASSIUM	MG/KG	5930.000		4840.000		5410.000		2950.000	
SELENIUM	MG/KG	---		---		---		---	
SILVER	MG/KG	0.950	U	1.000	U	1.000	U	0.930	U
SODIUM	MG/KG	36.400	U	110.000	U	39.000	U	85.300	U
THALLIUM	MG/KG	---		---		---		---	
VANADIUM	MG/KG	1.900	U	6.200	B	2.000	U	9.200	B
ZINC	MG/KG	6.900	U	16.200		10.100		33.300	
TITANIUM	MG/KG	16.800		191.000		12.800		292.000	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFL48 ~~354105A~~ 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4857
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _88.8

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	192			P	
7440-36-0	Antimony	11.6	B		P	
7440-38-2	Arsenic	0.42	U	WN	F	WS
7440-39-3	Barium	27.3	B		P	
7440-41-7	Beryllium	0.22	U		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	21400			P	
7440-47-3	Chromium	2.2	U	*	P	
7440-48-4	Cobalt	2.2	U		P	
7440-50-8	Copper	6.2			P	
7439-89-6	Iron	278			P	
7439-92-1	Lead	0.47	B		F	
7439-95-4	Magnesium	5990			P	
7439-96-5	Manganese	25.7			P	
7439-97-6	Mercury	0.10	U		CV	WS
7440-02-0	Nickel	4.5	U		P	
7440-09-7	Potassium	4140			P	
7782-49-2	Selenium	0.42	U	W	F	
7440-22-4	Silver	1.1	U		P	
7440-23-5	Sodium	110	B		P	u
7440-28-0	Thallium	0.42	U		F	
7440-62-2	Vanadium	2.2	U		P	
7440-66-6	Zinc	8.4			P	u
	Titanium	19.1			P	

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFL9 ~~354106A~~ 03 6/6/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0279 SAS No.: SDG No.: W0022

Matrix (soil/water): SOIL Lab Sample ID: AA4858

Level (low/med): LOW Date Received: 03/30/94

% Solids: 91.7

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	157			P	u
7440-36-0	Antimony	10.2	U		P	
7440-38-2	Arsenic	0.42	~~U~~	WN	F	US
7440-39-3	Barium	33.9	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	1.0	U		P	
7440-70-2	Calcium	28900			P	
7440-47-3	Chromium	2.0	U	*	P	
7440-48-4	Cobalt	2.0	U		P	
7440-50-8	Copper	7.6			P	
7439-89-6	Iron	298			P	
7439-92-1	Lead	0.42	U		F	
7439-95-4	Magnesium	8160			P	
7439-96-5	Manganese	41.6			P	
7439-97-6	Mercury	0.10	~~U~~		CV	US
7440-02-0	Nickel	4.1	U		P	
7440-09-7	Potassium	4740			P	
7782-49-2	Selenium	0.42	U		F	
7440-22-4	Silver	1.1	~~B~~		P	u
7440-23-5	Sodium	129	~~B~~		P	u
7440-28-0	Thallium	0.42	U		F	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	9.7			P	u
	Titanium	19.7			P	

Color Before: N/A Clarity Before: N/A Texture: COARSE

Color After: COLORLESS Clarity After: CLEAR Artifacts: YES

Comments:

ARTIFACTS INCLUDE TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BCBFM0 ~~354101A~~ 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4853
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _92.2

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	419			P	
7440-36-0	Antimony	15.8			P	
7440-38-2	Arsenic	0.43	~~U~~	N	F	US
7440-39-3	Barium	18.9	B		P	
7440-41-7	Beryllium	0.21	U		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	19900			P	
7440-47-3	Chromium	2.1	U	*	P	
7440-48-4	Cobalt	2.1	U		P	
7440-50-8	Copper	6.9			P	
7439-89-6	Iron	830			P	
7439-92-1	Lead	0.75			F	
7439-95-4	Magnesium	4510			P	
7439-96-5	Manganese	59.5			P	
7439-97-6	Mercury	0.10	~~U~~		CV	US
7440-02-0	Nickel	4.3	U		P	
7440-09-7	Potassium	1740			P	
7782-49-2	Selenium	0.43	U		F	
7440-22-4	Silver	1.1	U		P	
7440-23-5	Sodium	71.6	~~B~~		P	U
7440-28-0	Thallium	0.43	U		F	
7440-62-2	Vanadium	2.1	U		P	
7440-66-6	Zinc	34.0			P	
	Titanium	57.4			P	

Color Before: N/A Clarity Before: N/A Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts: YES

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFM1 ~~354102A~~ 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4854
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _91.5

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	578			P	
7440-36-0	Antimony	10.4	U		P	
7440-38-2	Arsenic	0.41	~~U~~	WN	F	WS
7440-39-3	Barium	27.7	B		P	
7440-41-7	Beryllium	0.21	U		P	
7440-43-9	Cadmium	1.0	U		P	
7440-70-2	Calcium	20800			P	
7440-47-3	Chromium	2.1	U	*	P	
7440-48-4	Cobalt	2.1	U		P	
7440-50-8	Copper	4.1	B		P	
7439-89-6	Iron	1110			P	
7439-92-1	Lead	0.70			F	
7439-95-4	Magnesium	3470			P	
7439-96-5	Manganese	48.2			P	
7439-97-6	Mercury	0.10	~~U~~		CV	WS
7440-02-0	Nickel	4.2	U		P	
7440-09-7	Potassium	1130			P	
7782-49-2	Selenium	0.41	U		F	
7440-22-4	Silver	1.0	U		P	
7440-23-5	Sodium	75.6	~~B~~		P	u
7440-28-0	Thallium	0.41	U		F	
7440-62-2	Vanadium	2.9	B		P	
7440-66-6	Zinc	11.0			P	u
	Titanium	80.9			P	

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

Verified 6/12/94

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFM2 ~~354103A~~ 10/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_
Matrix (soil/water): SOIL_ Lab Sample ID: AA4855
Level (low/med): LOW__ Date Received: 03/30/94
% Solids: _89.3

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	226			P	
7440-36-0	Antimony	11.1	U		P	
7440-38-2	Arsenic	0.42	~~U~~	WN	F	WS
7440-39-3	Barium	22.3	B		P	
7440-41-7	Beryllium	0.22	U		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	15400			P	
7440-47-3	Chromium	2.2	U	*	P	
7440-48-4	Cobalt	2.2	U		P	
7440-50-8	Copper	12.2			P	
7439-89-6	Iron	433			P	
7439-92-1	Lead	1.0			F	
7439-95-4	Magnesium	4530			P	
7439-96-5	Manganese	37.1			P	
7439-97-6	Mercury	0.11	~~U~~		CV	WS
7440-02-0	Nickel	4.4	U		P	
7440-09-7	Potassium	8390			P	
7782-49-2	Selenium	0.42	U		F	
7440-22-4	Silver	1.1	U		P	
7440-23-5	Sodium	161	B		P	
7440-28-0	Thallium	0.42	U		F	
7440-62-2	Vanadium	2.2	U		P	
7440-66-6	Zinc	20.4			P	
	Titanium	32.3			P	

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:
ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBFM3 ~~354104A~~ 6/6/94

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO279 SAS No.: _____ SDG No.: W0022_

Matrix (soil/water): SOIL_ Lab Sample ID: AA4856

Level (low/med): LOW__ Date Received: 03/30/94

% Solids: _89.9

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	274			P	
7440-36-0	Antimony	12.3	B		P	
7440-38-2	Arsenic	0.44	~~U~~	WN	F	US
7440-39-3	Barium	19.9	B		P	
7440-41-7	Beryllium	0.22	U		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	15600			P	
7440-47-3	Chromium	2.2	U	*	P	
7440-48-4	Cobalt	2.2	U		P	
7440-50-8	Copper	7.9			P	
7439-89-6	Iron	534			P	
7439-92-1	Lead	0.55	B		F	
7439-95-4	Magnesium	5850			P	
7439-96-5	Manganese	41.3			P	
7439-97-6	Mercury	0.10	~~U~~		CV	US
7440-02-0	Nickel	4.3	U		P	
7440-09-7	Potassium	5360			P	
7782-49-2	Selenium	0.44	U		F	
7440-22-4	Silver	1.1	U		P	
7440-23-5	Sodium	77.1	~~B~~		P	U
7440-28-0	Thallium	0.44	U		F	
7440-62-2	Vanadium	2.2	U		P	
7440-66-6	Zinc	12.0			P	U
	Titanium	40.2			P	

Color Before: N/A_____ Clarity Before: N/A___ Texture: COARSE

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: YES___

Comments:

ARTIFACTS_INCLUDE_TWIGS.

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN1

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8553

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	110			P	
7440-36-0	Antimony	9.5	U		P	
7440-39-3	Barium	7.2	B		P	
7440-41-7	Beryllium	0.19	U		P	
7440-43-9	Cadmium	0.95	U		P	
7440-70-2	Calcium	2630			P	
7440-47-3	Chromium	1.9	U	*	P	
7440-48-4	Cobalt	1.9	U		P	
7440-50-8	Copper	5.6			P	
7439-89-6	Iron	226			P	
7439-95-4	Magnesium	1600			P	
7439-96-5	Manganese	11.5			P	
7439-97-6	Mercury	0.09	U		CV	US
7440-02-0	Nickel	3.8	U		P	
7440-09-7	Potassium	5930			P	
7440-22-4	Silver	0.95	U		P	
7440-23-5	Sodium	36.4	B		P	u
7440-62-2	Vanadium	1.9	U		P	
7440-66-6	Zinc	6.9			P	u
	Titanium	16.8			P	

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

There was insufficient sample to analyzed for As, Pb, Se, and Tl by GFAA.

FORM I - IN Verified ILM02.1

6/12/94

9613475.1186

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN2

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8547

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	1280			P	
7440-36-0	Antimony	10.0	U		P	
7440-39-3	Barium	25.0	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	1.0	U		P	
7440-70-2	Calcium	7780			P	
7440-47-3	Chromium	2.0	U	*	P	
7440-48-4	Cobalt	2.0	U		P	
7440-50-8	Copper	9.7			P	
7439-89-6	Iron	2730			P	
7439-95-4	Magnesium	2220			P	
7439-96-5	Manganese	72.1			P	
7439-97-6	Mercury	0.10	~~U~~		CV	UJ
7440-02-0	Nickel	4.0	U		P	
7440-09-7	Potassium	4840			P	
7440-22-4	Silver	1.0	U		P	
7440-23-5	Sodium	110	~~B~~		P	U
7440-62-2	Vanadium	6.2	B		P	
7440-66-6	Zinc	16.2			P	
	Titanium	191			P	

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

There was insufficient sample to analyze As, Pb, Se, & Tl by GFAA.

FORM I - IN Verified

ILM02.1

6/12/94

9613475.1187

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN3

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8554

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	96.6			P	
7440-36-0	Antimony	10.0	U		P	
7440-39-3	Barium	4.4	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	1.0	U		P	
7440-70-2	Calcium	2710			P	
7440-47-3	Chromium	2.0	U	*	P	
7440-48-4	Cobalt	2.0	U		P	
7440-50-8	Copper	6.0			P	
7439-89-6	Iron	182			P	
7439-95-4	Magnesium	1020			P	
7439-96-5	Manganese	18.0			P	
7439-97-6	Mercury	0.09	~~U~~		CV	US
7440-02-0	Nickel	4.0	U		P	
7440-09-7	Potassium	5410			P	
7440-22-4	Silver	1.0	U		P	
7440-23-5	Sodium	39.0	~~B~~		P	U
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	10.1			P	
	Titanium	12.8			P	

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

There was insufficient sample to analyze for As, Pb, Se, and Tl by GFAA.

FORM I - IN Verified ILM02.1

6/12/94

019

9613475.1188

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBKN4

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: W0520 SAS No.: SDG No.: BOBKN1

Matrix (soil/water): SOIL Lab Sample ID: AA8552

Level (low/med): LOW Date Received: 05/12/94

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	1870			P	
7440-36-0	Antimony	9.3	U		P	
7440-39-3	Barium	34.4	B		P	
7440-41-7	Beryllium	0.19	U		P	
7440-43-9	Cadmium	0.93	U		P	
7440-70-2	Calcium	10100			P	
7440-47-3	Chromium	2.5		*	P	
7440-48-4	Cobalt	2.0	B		P	
7440-50-8	Copper	11.7			P	
7439-89-6	Iron	4150			P	
7439-95-4	Magnesium	2260			P	
7439-96-5	Manganese	154			P	
7439-97-6	Mercury	0.09	~~U~~		CV	WS
7440-02-0	Nickel	3.7	U		P	
7440-09-7	Potassium	2950			P	
7440-22-4	Silver	0.93	U		P	
7440-23-5	Sodium	85.3	~~B~~		P	u
7440-62-2	Vanadium	9.2	B		P	
7440-66-6	Zinc	33.3			P	
	Titanium	292			P	

Color Before: BROWN Clarity Before: Texture: TWIGS

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

There was insufficient sample to analyzed for As, Se, Pb, and Tl by GFAA

FORM I - IN Verified

ILM02.1

6/12/94

020

9613475.1189

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

June 6, 1994

Job Number: 279; 520

This is the Certificate of Analysis for the following samples:

SDG:	W0022
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 30 and May 12, 1994
Number of Samples:	Ten (10)
Sample Type:	Soil

JUN 1994
RECEIVED
SDLA

I. Introduction

On March 30 and May 12, 1994, ten (10) 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. Soil results are reported on a dry weight basis.

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.

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

022

Westinghouse Hanford Company
June 6, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 279; 520

III. Quality Control

The samples for work order #279 were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 12 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. Samples were tracked with work order number 253.

The samples for work order #520 were digested on May 16, 1994 for ICP. The CVAA analysis for mercury was performed on May 17, 1994; the remaining metals were analyzed by ICP on May 17, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample number BOBNK4 for CVAA only. Spike recovery (accuracy) results were within acceptance limits. Duplicate RPD (precision) results were within acceptance limits. ICP analytes were tracked with QC from work order number 253. There was insufficient sample to analyze the samples by GFAA.

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.

023

682-1-89

Westinghouse Hanford Company
June 6, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 279; 520

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
AA4853	403541-01A	BOBFMO	METALS
AA4854	403541-02A	BOBFM1	"
AA4855	403541-03A	BOBFM2	"
AA4856	403541-04A	BOBFM3	"
AA4857	403541-05A	BOBFL8	"
AA4858	403541-06A	BOBFL9	"
AA8551	405204-01A	BOBKN2	"
AA8552	405204-02A	BOBKN4	"
AA8553	405204-03A	BOBKN1	"
AA8554	405204-04A	BOBKN3	"

Westinghouse Hanford Company
June 6, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 279; 520

IV. Certification

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

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

025

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006492

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No.
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment
Field Logbook No.
Shipped to ~~JTMA~~ IT
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4105 BOBFL8	Veg.	03-07-94	0945	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4205 BOBFL8	Veg.	03-07-94	0945	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Ashtenling IT 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

3-24-94 100 cpm KAA 3-24-94

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026

9613475.1194

0000025

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006495

Collector R.T. Sickle

Company Contact C.A. Rowley

Telephone 372-3293

SAF No. ~~93-263~~ (Veg) 94-065 DJE 3/22/94

Project Designation 216-U-8 Vitrified Clay Pipeline

Sampling Locations 216-U-8 Crib

WO#279

Ice Chest No.

Bill of Lading/Airbill No. N/A

Offsite Property No. NA

Method of Shipment

Field Logbook No.

Shipped to ~~UETMA~~ IT DJE 3/22/94

SPECIAL INSTRUCTIONS

Possible Sample Hazards/Remarks Unknown

Special Handling and/or Storage Keep Cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4106 BOBFL9	Veg.	03-07-94	1000	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4206 BOBFL9	Veg.	03-07-94	1000	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Holtenberg IT MAS 3-24-94 1100

*Matrix

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

1300 counts
KLL
3-24-94
11:00

9613475.1195

0000026

027

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#279	Page 1 of ~~12~~ 1
		006439

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) 94-065 DRC 3/22/94
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment
Field Logbook No.
Shipped to ~~TMA~~ IT DRC 3/22/94
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

3/29/94

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
40345 4101 BOBFM0	Veg.	03-07-94	1015	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4201 BOBFM0	Veg.	03-07-94	1015	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Hollenberg TMA 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

800 CPM
TMA 3-24-94

9613475.1196

0000021

028

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006440

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) 94-065 5/22/94
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No. 125
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment Emery
Field Logbook No.
Shipped to ~~ATHA~~ IT 5/22/94
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4102	BOBFM1	Veg.	03-07-94	1015	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4202	BOBFM1	Veg.	03-07-94	1015	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
Roy T Sickle	3-15-94	1000	D L Edwards
R.T. Sickle	3-24-94	0900	Karen Hetherington IT45 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

450 count CPM
KHA
3-24-94

9613475.1197

029

0000022

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006441

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) DRC 3/22/94 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No. 80 JEM
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment Emery
Field Logbook No.
Shipped to ~~THA~~ IT DRC 3/22/94
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4103	BOBFM2	Veg.	03-07-94	1030	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4203	BOBFM2	Veg.	03-07-94	1030	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	0900	Karen Hottenlig FTAS 11:00 3-24-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

FAA 3-24-94 100 cpm
FAA 3-24-94

030

9613475.1198

0000023

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006442

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) DXC 3/22/94 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
WO#279
Ice Chest No. CWS 003
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment Energy
Field Logbook No.
Shipped to ~~Weston~~ IT DXC 3/22/94
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4104	BOBFM3	Veg.	03-07-94	1030	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4204	BOBFM3	Veg.	03-07-94	1030	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3-15-94	1000	D.L. Edwards
D.L. Edwards	3-24-94	1100	Karen Hattenburg KHS 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

Less than 100 cpm
KH
3-24-94

031

9613475.1199

0000024

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#520	Page 1 of 1
		006458

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN1	X8	03-29-94	1015	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 40520403 CPL	
BOBKN1	X8	03-29-94	1015	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

40412003

Chain of Possession (Sign and Print Names) Relinquished By	Date	Time	Received By
R.T. Sickle RT Sickle	3-31-94	0815	Daniel L. Edwards
Daniel L. Edwards	4-4-94	0900	Karen Schlenker 4-4-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1200

032

WO#520

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006459

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

SPECIAL INSTRUCTIONS
VEGETATION

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN2	X8	03-29-94	1022	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 1/CE52401 CPL	
BOBKN2	X8	03-29-94	1022	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

404/2001

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[signature] R.T. Sickle	3-31-94	0815	[signature]
[signature]	4-4-94	0900	[signature] 11-15 4-4-94
			2100 [illegible]

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1201

033

0000027

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#520	Page 1 of 1
		006460

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN3	XS	03-29-94	1048	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 40520404 CPL	
BOBKN3	XS	03-29-94	1048	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

404/2004

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle RT Sickle	3-31-94	0815	Daniel L. Edwards
Daniel L. Edwards	4-4-94	0900	Kim Ackenburg KMA 4-4-94 400 Pmy

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1202

034

0000030

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST WO#520	Page 1 of 1
		006461

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN4	X8	03-29-94	1052	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury 4105.20440.2 CPL	
BOBKN4	X8	03-29-94	1052	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

40417002

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
RT Sickle	3-31-94	0815	David L. Edwards
David L. Edwards	4-4-94	0900	Karen Hattenburg 11:15 4-4-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1203

035

0000028

9613475.1204

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: WOOO22-ITC-035		
VALIDATOR: [illegible]		LAB: ITC		DATE: 06/12/94	
~~CASE:~~ Work order #279			SDG: WOOO22-ITC-035		
ANALYSES PERFORMED					
☒ CLP/ICP	☒ CLP/GFAA	☒ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

6/13/94

SAMPLES/MATRIX ~~Soils~~ 06/14/94 Vegetation

BOBFM0 BOBFL9

BOBFM1

BOBFM2

BOBFM3

BOBFL8

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: These are vegetation samples, but the validation was based on soils.

2. HOLDING TIMES

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

Comments: Hg analysis was performed out of holding time. Assoc. results have been qualified as estimated (UJ).

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . 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: See attached lab blank for detects in blank. All assoc. results <5x respective blank conc. have been qualified as ~~estimated~~ undetected (U).
6/12/94

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
Comments: Qualify all arsenic results as estimated (UJ) since the MS%R is 67%.

Titanium results do not require qualification since the sample result >4x spike added.

LCS control limits of 80-120 were applied to titanium. No qualification is required.

038

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: The lab flagged Cr results since the dup. RPD is 27%. However, this is acceptable according to the DV requirements. No qualification is required.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A 6/13/94

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: The laboratory flagged the Selenium result for sample B0BFL8 indicating that the GFAA analytical spike recovery was unacceptable. However, the GFAA spike %R for this sample was 89.2% which is within the DV requirements of 85 to 115%. Therefore, no qual. is required. 6/15/94

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 6/15/94

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

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

Comments:

039

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Sample locations are not currently available. Field QC will be evaluated in the final summary report.

040

HOLDING TIME SUMMARY

W0022-ITC-035

2

6/13/94

SDG:	VALIDATOR: [illegible]	DATE: 6/13/94	PAGE 1 OF 1
COMMENTS: Metals - Work Order # W0279.			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BFM0	ICP	3/07/94		4/13/94		37	None
B0BFM1		3/07/94					
B0BFM2		3/07/94					
B0BFM3		3/07/94					
B0BFL8		3/07/94					
B0BFL9		3/07/94					
B0BFM0	As	3/07/94		4/14/94		38	
B0BFM1		3/07/94					
B0BFM2		3/07/94					
B0BFM3		3/07/94					
B0BFL8		3/07/94					
B0BFL9		3/07/94					
B0BFM0	Pb	3/07/94		4/11-4/12		35-36	
B0BFM1		3/07/94					
B0BFM2		3/07/94					
B0BF M3		3/07/94					
B0BFL8		3/07/94					

9613475.1209

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

HOLDING TIME SUMMARY

WS0022-ITC-035

SDG:	VALIDATOR: [illegible]	DATE: 6/13/94	PAGE 2 OF 2
COMMENTS: Metals - Work Order # W0279			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBFL9	Pb	3/07/94		4/11-4/12		35-36	None
BOBFM0	Se	3/07/94		4/14/94		38	
BOBFM1		3/07/94					
BOBFM2		3/07/94					
BOBFM3		3/07/94					
BOBFL8		3/07/94					
BOBFL9		3/07/94					
BOBFM0	Tl	3/07/94		4/14/94		38	
BOBFM1		3/07/94					
BOBFM2		3/07/94					
BOBFM3		3/07/94					
BOBFL8		3/07/94					
BOBFL9		3/07/94					
BOBFM0	Hg	3/07/94		4/07/94		31	US
BOBFM1		3/07/94					
BOBFM2		3/07/94					
BOBFM3		3/07/94					
BOBFL8	Hg	3/07/94		4/07/94		31	US
BOBFL9	Hg	3/07/94		4/07/94		31	US

6/13/94

6/13/94

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: W0279 SAS No.: _____ SDG No.: W0022_

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	P&SO4IIA(AA6030) CP&SO4 07A(AAS6oF) AP&S 04IIA(AA6037) Preparation Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	157.11 37.422	B	P
Antimony	50.0	U	50.0	U	50.0	U	50.0	U	10.000	U	P
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Barium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Calcium	20.0	U	20.0	U	20.0	U	20.0	U	29.196	B	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Cobalt	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	18.828	B	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	7.026	B	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.100	U	CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	4.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Silver	5.0	U	5.0	U	5.0	U	5.0	U	54.49 1.000	U	P
Sodium	100.0	U	100.0	U	100.0	U	100.0	U	30.898	B	P
Thallium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	11.94 2.388	B	P
Titanium	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P

FORM III - IN ILM02.1

6/15/94

5/4/94

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: W0279 SAS No.: _____ SDG No.: W0022_

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			40.0	U							P
Antimony			50.0	U							P
Arsenic											NR
Barium			2.0	U							P
Beryllium			1.0	U							P
Cadmium			5.0	U							P
Calcium			20.0	U							P
Chromium			10.0	U							P
Cobalt			10.0	U							P
Copper			10.0	U							P
Iron			10.0	U							P
Lead			2.0	U	2.0	U	2.0	U			F
Magnesium			30.0	U							P
Manganese			2.0	U							P
Mercury											NR
Nickel			20.0	U							P
Potassium			1000.0	U							P
Selenium											NR
Silver			32 6.4	B							P
Sodium			100.0	U							P
Thallium											NR
Vanadium			10.0	U							P
Zinc			5.0	U							P
Titanium			3.0	U							P

FORM III - IN

ILM02.1
8
5/4/94

6/13/94

9613475.1213

~~0000082~~

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

0343001S

Lab Name: ITAS_KNOXVILLE_____ Contract:HANFORD___

Lab Code: ITSTU_ Case No.: W0279 SAS No.: _____ SDG No.: W0022_
Matrix: __SOIL_____ Level (low/med): _LOW____
% Solids for Sample: _93.0

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	93.2331		10.4395	U	104.40	89.3		P
Arsenic	75-125	5.9140		0.4321	B	8.12	67.5	N	F
Barium	75-125	460.9479		53.2540		417.58	97.6		P
Beryllium	75-125	10.9469		0.2965	B	10.44	102.0		P
Cadmium	75-125	10.4165		1.0440	U	10.44	99.8		P
Calcium									NR
Chromium	75-125	57.4131		12.7884		41.76	106.9		P
Cobalt	75-125	112.5712		6.1906	B	104.40	101.9		P
Copper	75-125	59.1273		10.4040		52.20	93.3		P
Iron									NR
Lead	75-125	5.8105		1.6454		4.06	102.6		F
Magnesium									NR
Manganese	75-125	323.8355		197.5947		104.40	120.9		P
Mercury	75-125	0.6086		0.1075	U	0.54	112.7		CV
Nickel	75-125	113.2456		11.6860		104.40	97.3		P
Potassium									NR
Selenium	75-125	1.6636		0.4058	U	2.03	82.0		F
Silver	75-125	10.5648		1.0440	U	10.44	101.2		P
Sodium									NR
Thallium	75-125	8.9714		0.4058	U	10.14	88.5		F
Vanadium	75-125	133.0723		22.2069		104.40	106.2		P
Zinc	75-125	133.3918		32.6923		104.40	96.5		P
Titanium		994.4483		690.3873		104.40	291.2		P

Comments:
ARTIFACTS_INCLUDE_ROCKS.

FORM V (Part 1) - IN ILM02.1

6/12/94

8
5/4/94

ACCURACY DATA SUMMARY

SDG: 140022-ITC-035	VALIDATOR: [illegible]	DATE: 6/12/94	PAGE 1 OF 1	
COMMENTS: Metals - GFAA Analytical Spike Recovery				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B0BFM0	Arsenic	82%	B0BFM0	UJ
B0BFM1	Arsenic	81%	B0BFM1	UJ
B0BFM2	Arsenic	81%	B0BFM2	UJ
B0BFM3	Arsenic	81%	B0BFM3	UJ
B0BFL8	Arsenic	79%	B0BFL8	UJ
B0BFL9	Arsenic	76%	B0BFL9	UJ

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: W0022-ITC-035	
VALIDATOR: [illegible]	LAB: ITC		DATE: 06/13/94
~~CASE:~~ Work Order # 520		SDG: W0022-ITC-035	

6/13/94

ANALYSES PERFORMED					
☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Vegetation

B0BKN1

B0BKN2

B0BKN3

B0BKN4

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: These are vegetation samples, but the validation was based on soils.

2. HOLDING TIMES

Are sample holding times acceptable? 6/13/94 . . . . . 6/13/94 . . . . . Yes No N/A

Comments: Mercury analysis ~~were~~ was performed out of holding time. Therefore, assoc results have been qualified as estimated (UJ).

047

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: Na and Zn were detected in the prep blank. Results < 5x blank conc. have been qualified as undetected (U).

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
Comments: LCS control limits of 80 to 120 were applied for antimony and titanium. No qualification was required.

048

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

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

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

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

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

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

Comments: Sample locations are not currently available. Field QC will be evaluated in the Final Summary report. - The lab flagged Cs results since the dup RPD is 27%. However, this is acceptable according to the DV requirements. No qual. is required.

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: There was insufficient sample to analyze for As, Pb, Se and Tl by GFAA. Therefore, these 4 analytes were not reported for the associated samples.

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

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

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

Comments:

HOLDING TIME SUMMARY

W0022-ITC-035

SDG:	VALIDATOR: [illegible]	DATE: 6/13/94	PAGE 1 OF 1
COMMENTS: Metals, Work Order #520			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BKN1	ICP	3/29/94		05/17/94	49		None
B0BKN2	↓	3/29/94		↓	49		↓
B0BKN3	↓	3/29/94		↓	49		↓
B0BKN4	↓	3/29/94		↓	49		↓
B0BKN1	Hg	3/29/94		05/17/94	49		UJ
~~B0BKN1~~						~~6/13/94~~	
B0BKN2	Hg	3/29/94		05/17/94	49		UJ
B0BKN3	↓	3/29/94		↓	49		UJ
B0BKN4	↓	3/29/94		↓	49		UJ

6/13/94 (2)

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: W0520 SAS No.: _____ SDG No.: BOBKN1

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

CPBS0517A AA9129
PBS0516A AA9152

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank 5x	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	18.936	B	P
Antimony	50.0	U	50.0	U	50.0	U	50.0	U	10.000	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Calcium	20.0	U	20.0	U	20.0	U	20.0	U	15.348	B	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Cobalt	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	11.966	B	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	6.000	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Mercury	0.2	U	0.2	U	0.2	U			0.100	U	CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	4.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Sodium	100.0	U	100.0	U	100.0	U	100.0	U	173 34.732	B	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	9.01 0.802	B	P
Titanium	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P

FORM III - IN ILM02.1

6/13/94

9613475.1220

W0022-ITC-035R

MEMORANDUM

JUN 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record

June 20, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0022-ITC-035, (923-E418, Filename W0022R.UP2)

INTRODUCTION

JCM 6/29/94

This memo presents the results of data validation on data package W0022-ITC-035 prepared by IT Analytical Services of Richland, Washington. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BFM0	3/07/94	VEGETATION	SEE NOTE 1
B0BFM1	3/07/94	VEGETATION	
B0BFM2	3/07/94	VEGETATION	
B0BFM3	3/07/94	VEGETATION	
B0BFL8	3/07/94	VEGETATION	
B0BFL9	3/07/94	VEGETATION	
B0BKN1	3/29/94	VEGETATION	
B0BKN2	3/29/94	VEGETATION	
B0BKN3	3/29/94	VEGETATION	
B0BKN4	3/29/94	VEGETATION	

RECEIVED JUN 27 1994 VALIDATION DOCUMENTATION SDLA

Note 1. The samples were analyzed for americium-241, neptunium-237, plutonium-238, 239/240 and uranium-234, 235 and 238 by alpha spectroscopy; iodine-129 and selected radionuclides by gamma spectroscopy; gross alpha, gross beta and strontium-90 by gas proportional counting; selenium-79 and technetium-99 by liquid scintillation counting and total uranium by kinetic phosphorimetry.

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

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the minor deficiencies noted below.

Data Package ID: W0022-ITC-035 Analysis: Radiochemistry

Sample Result Verification. All sample results were supported in the raw data. Minimum detectable activities (MDA) for neptunium-237, plutonium-239, selenium-79, and technetium-99 could not be accurately verified by recalculation using the formulae provided by IT, therefore results for these analytes have been qualified as estimated (UJ for non-detects).

Detection Limits. Detection limit goals were met for all results with the exception of europium-155, europium-154, europium-152, cobalt-60, iodine-129 and technetium-99, in a few of the samples. Attachment 3 provides supporting documentation. The laboratory did not provide an explanation in the case narrative regarding the detection limits.

Completeness. The data package was complete for all requested analyses. Ten samples (10) were validated in this data set with a total of 298 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives.

MAJOR DEFICIENCIES

No major deficiencies were identified requiring rejection of data.

MINOR DEFICIENCIES

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

Continuing Calibration

- Detectors used for americium-241, curium-242, and curium-244 analyses were not calibrated within one week of analysis. Attachments 2 and 5 provide a summary of the samples affected and qualifications applied.

Laboratory Control Samples

- LCS percent recovery was unacceptable for iodine-129, uranium-235, and strontium. Attachments 2 and 5 provide a summary of the samples affected and qualifications applied. No qualification was necessary for iodine-129 since all results were less than the minimum detectable activity.

DATA REPORTING

- Results reported at a concentration of less than the minimum detectable activity have been qualified as undetected (U) and the MDA is reported in the validated data summary in attachment 3.

Revised page
Rev 4 of 4 of 4
002

Data Package ID: W0022-ITC-035 Analysis: Radiochemistry

REFERENCES

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

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

Mat 6/27/94
New Page
002A

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

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

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

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

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

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

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

SDG: W0022-ITC-035	VALIDATOR: Schildt	DATE: June 22, 1994	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
AMERICIUM-241 CURIUM-242 CURIUM-244	UJ NONDETECTS	B0BFM0 B0BFM3 B0BFL8 B0BKN1	CONTINUING CALIBRATION NOT CHECKED WITHIN ONE WEEK OF SAMPLE ANALYSIS
NEPTUNIUM-237 PLUTONIUM-239 SELENIUM-79 TECHNETIUM-99	UJ NONDETECTS	ALL	RESULTS COULD NOT BE VERIFIED BY RECALCULATION USING THE FORMULAE PROVIDED BY IT
URANIUM-235	UJ	B0BFM2	LABORATORY CONTROL SAMPLE RECOVERY <70%
STRONTIUM	J DETECTS	B0BFM0 B0BFM1 B0BFM2 B0BFM3 B0BFL8 B0BKN2 B0BKN4 B0BKN1 B0BKN3	LABORATORY CONTROL SAMPLE RECOVERY >130%

9615475.1225

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: WJG22-11C-035

	Samp#	B0BFL8		B0BFL9		B0BFM0		B0BFM1		B0BFM2		B0BFM3	
	Date	3-7-94		3-7-94		3-7-94		3-7-94		3-7-94		3-7-94	
	Location	216-U-8		216-U-8		216-U-8		216-U-8		216-U-8		216-U-8	
	Depth	---		---		---		---		---		---	
	Type	VEGETATION		VEGETATION		VEGETATION		VEGETATION		VEGETATION		VEGETATION	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.020	UJ	0.023	U	0.021	UJ	0.026	U	0.013	U	0.027	UJ
CURIUM-242	PCI/G	0.028	UJ	0.019	U	0.029	UJ	0.022	U	0.018	U	0.043	UJ
CURIUM-244	PCI/G	0.020	UJ	0.016	U	0.026	UJ	0.023	U	0.013	U	0.019	UJ
NEPTUNIUM-237	PCI/G	0.315	UJ	0.015	UJ	0.010	UJ	0.012	UJ	0.011	UJ	0.010	UJ
PLUTONIUM-239/240	PCI/G	0.330	UJ	0.071		0.023		0.015	UJ	0.024		0.034	UJ
PLUTONIUM-238	PCI/G	0.317	U	0.050	U	0.032	U	0.015	U	0.054	U	0.024	U
URANIUM-234	PCI/G	0.055		0.198		0.324		0.186		0.077	U	0.080	
URANIUM-235	PCI/G	0.042	U	0.031	U	0.035	U	0.059	U	0.082	UJ	0.052	U
URANIUM-238	PCI/G	0.047		0.189		0.229		0.145		0.082	U	0.052	U
POTASSIUM-40	PCI/G	9.280		5.370		3.760		3.430		5.290		3.580	
COBALT-60	PCI/G	0.020	U	0.020	U	0.017	U	0.021	U	0.022	U	0.019	U
EUROPIUM-152	PCI/G	0.084	U	0.091	U	0.084	U	0.106	U	0.099	U	0.095	U
CESIUM-137	PCI/G	0.158		0.974		17.200		6.320		0.579		0.611	
CESIUM-134	PCI/G	0.018	U	0.026	U	0.025	U	0.022	U	0.018	U	0.016	U
RUTHENIUM-106	PCI/G	0.185	U	0.261	U	0.256	U	0.234	U	0.177	U	0.159	U
RADIUM-224	PCI/G	---		0.234		0.069		0.049		---		0.048	
SODIUM-22	PCI/G	0.020	U	0.021	U	0.019	U	0.021	U	0.024	U	0.019	U
EUROPIUM-155	PCI/G	0.097	U	0.234	U	0.122	U	0.115	U	0.044	U	0.041	U
THORIUM-234	PCI/G	---		---		---		---		---		2.630	
BERYLLIUM-7	PCI/G	1.890		2.700		2.300		2.210		2.020		2.610	
EUROPIUM-154	PCI/G	0.055	U	0.057	U	0.050	U	0.058	U	0.066	U	0.053	U
THALLIUM-208	PCI/G	---		0.043		---		0.037		---		0.038	
ACTINIUM-228	PCI/G	---		---		---		---		0.041		---	
URANIUM-238 (by gamma scan)	PCI/G	---		0.193		---		---		0.134		---	
LEAD-212	PCI/G	0.024		0.219		0.064		0.046		0.045		0.045	
THORIUM-232	PCI/G	---		0.185		0.152		0.118		---		---	
LEAD-214	PCI/G	---		0.193		---		---		0.134		---	
RADIUM-228	PCI/G	---		---		---		---		0.042		---	
IODINE-129	PCI/G	1.950	U	3.860	U	1.760	U	2.050	U	0.629	U	0.487	U
ALPHA	PCI/G	4.400	U	3.860	U	3.850	U	3.640	U	4.640	U	4.870	U
BETA	PCI/G	817.000		4220.000		879.000		614.000		24.800		35.400	
TOTAL STRONTIUM	PCI/G	328.000	J	1380.000		492.000	J	426.000	J	10.400	J	10.000	J
SELENIUM-79	PCI/G	1.250	UJ	2.660		1.440		1.850		1.220	UJ	1.210	UJ
TECHNETIUM-99	PCI/G	295.000		117.000		49.500		46.800		29.400		28.700	
URANIUM	UG/G	0.209		0.752		0.782		0.613		0.126		0.106	

Verified Rev 6/27/94

Revised Page 6/27/94 006

Validated Data Summary, Data Package: W0022-ITC-035

	Samp#	BOBKN1		BOBKN2		BOBKN3		BOBKN4	
	Date	3-29-94		3-29-94		3-29-94		3-29-94	
	Location	216-U-8		216-U-8		216-U-8		216-U-8	
	Depth	---		---		---		---	
	Type	VEGETATION		VEGETATION		VEGETATION		VEGETATION	
	Comments	---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.024	UJ	0.020		0.022	U	0.040	U
CURIUM-242	PCI/G	0.030	UJ	0.017	U	0.028	U	0.039	U
CURIUM-244	PCI/G	0.029	UJ	0.020	U	0.025	U	0.031	U
NEPTUNIUM-237	PCI/G	0.010	UJ	0.011	UJ	0.012	UJ	0.012	UJ
PLUTONIUM-239/240	PCI/G	0.024	UJ	0.075		0.014	UJ	0.039	UJ
PLUTONIUM-238	PCI/G	0.014	U	0.035	U	0.028	U	0.028	U
URANIUM-234	PCI/G	0.048		0.104		0.049		0.255	
URANIUM-235	PCI/G	0.042	U	0.047	U	0.038	U	0.069	U
URANIUM-238	PCI/G	0.034	U	0.134		0.063		0.191	
POTASSIUM-40	PCI/G	6.370		6.780		6.650		5.270	
COBALT-60	PCI/G	0.025	U	0.065	U	0.023	U	0.074	U
EUROPIUM-152	PCI/G	0.098	U	0.330	U	0.104	U	0.336	U
CESIUM-137	PCI/G	0.118		1.670		0.072		1.110	
CESIUM-134	PCI/G	0.017	U	0.065	U	0.021	U	0.071	U
RUTHENIUM-106	PCI/G	0.174	U	0.601	U	0.212	U	0.698	U
RADIUM-224	PCI/G	0.045		0.268		0.013		0.301	
SODIUM-22	PCI/G	0.024	U	0.074	U	0.022	U	0.073	U
EUROPIUM-155	PCI/G	0.057	U	0.238	U	0.119	U	0.279	U
THORIUM-234	PCI/G	---		---		---		18.400	
BERYLLIUM-7	PCI/G	1.570		---		2.580		1.800	
EUROPIUM-154	PCI/G	0.067	U	0.202	U	0.059	U	0.202	U
THALLIUM-208	PCI/G	0.011		0.165		0.009		---	
ACTINIUM-228	PCI/G	---		---		---		---	
URANIUM-238 (by gamma scan)	PCI/G	---		0.471		---		---	
LEAD-212	PCI/G	0.043		0.257		0.013		0.289	
THORIUM-232	PCI/G	0.045		0.464		---		---	
LEAD-214	PCI/G	---		0.471		---		---	
RADIUM-228	PCI/G	---		---		---		---	
IODINE-129	PCI/G	1.010	U	1.970	U	0.655	U	1.700	U
ALPHA	PCI/G	3.640	U	7.420		4.640	U	5.880	
BETA	PCI/G	117.000		235.000		721.000		417.000	
TOTAL STRONTIUM	PCI/G	523.000	J	295.000	J	66.900	J	491.000	J
SELENIUM-79	PCI/G	1.220	UJ	1.120	UJ	1.210		1.150	UJ
TECHNETIUM-99	PCI/G	5.340		23.500		36.100		45.500	
URANIUM	UG/G	0.064		0.531		0.156		0.468	

Verified 6/24/94

9613475.1227

9613475.1228

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-05 MATRIX: VEGETATION

WHC ID: BOBFL8 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	7.34E-03	1.47E-02	1.47E-02	1.99E-02	0.463	RD3302	UJ
CM-242	0.00E+00	0.00E+00	3.07E-02	2.77E-02	0.463	RD3302	UJ
CM-244	0.00E+00	0.00E+00	2.22E-02	2.00E-02	0.463	RD3202	UJ
NP-237	-3.66E-04	7.32E-04	7.36E-04	1.53E-02	0.832	RD3208	UJ
PU239/40	2.35E-02	2.49E-02	2.51E-02	2.96E-02	0.68	RD3209	UJ
PU-238	0.00E+00	0.00E+00	1.86E-02	1.68E-02	0.68	RD3209	U
U-234	5.54E-02	4.17E-02	4.25E-02	4.37E-02	0.517	RD3234	
U-235	-2.94E-03	2.63E-03	2.67E-03	4.16E-02	0.517	RD3234	U
U-238DA	4.74E-02	3.91E-02	3.97E-02	4.56E-02	0.517	RD3234	
K-40	9.28E+00	4.35E-01	1.03E+00	N/A	N/A	RD3219	
CO-60	8.47E-03	1.12E-02	1.12E-02	1.98E-02	N/A	RD3219	U
EU-152	8.00E-02	4.26E-02	4.34E-02	8.41E-02	N/A	RD3219	U
CS-137DA	1.58E-01	2.12E-02	2.65E-02	N/A	N/A	RD3219	
CS-134	-3.68E-04	1.05E-02	1.05E-02	1.77E-02	N/A	RD3219	U
RU-106DA	8.98E-03	1.08E-01	1.08E-01	1.85E-01	N/A	RD3219	U
NA-22	-2.58E-03	1.22E-02	1.22E-02	2.01E-02	N/A	RD3219	U
EU-155	5.31E-02	6.29E-02	6.31E-02	9.71E-02	N/A	RD3219	U
PB-212	2.40E-02	3.50E-02	3.51E-02	N/A	N/A	RD3219	
BE-7	1.89E+00	3.74E-01	4.19E-01	N/A	N/A	RD3219	
EU-154	-7.01E-03	3.31E-02	3.31E-02	5.47E-02	N/A	RD3219	U
I-129LP	-3.52E-01	1.17E+00	1.17E+00	1.95E+00	N/A	RD3219	U
ALPHA	5.42E-01	2.17E+00	2.17E+00	4.40E+00	1	RD3222	U
BETA	8.17E+02	1.85E+01	5.70E+01	2.80E+00	1	RD3222	
TOTAL-SR	3.28E+02	2.04E+00	8.11E+01	1.34E-01	0.868	RD3204	J
SE-79	6.70E-01	6.02E-01	1.62E+00	1.25E+00	0.772	RD3253	UJ
TC-99	2.96E+02	1.77E+00	3.24E+01	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	2.09E-01	N/A	3.13E-02	5.02E-03	0.781	RD4200	

6/24/94

9613475.1229

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-06 MATRIX: VEGETATION

WHC ID: BOBFL9 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	9.31E-03	1.44E-02	1.44E-02	2.31E-02	0.665	RD3302	U
CM-242	0.00E+00	0.00E+00	2.11E-02	1.91E-02	0.665	RD3302	U
CM-244	0.00E+00	0.00E+00	1.53E-02	1.38E-02	0.665	RD3202	U
NP-237	8.55E-03	1.26E-02	1.28E-02	1.49E-02	0.832	RD3208	UJ
PU239/40	7.08E-02	5.01E-02	5.15E-02	2.39E-02	0.459	RD3209	
PU-238	-3.55E-03	5.01E-03	5.05E-03	5.01E-02	0.459	RD3209	U
U-234	1.98E-01	7.42E-02	7.93E-02	4.50E-02	0.57	RD3234	
U-235	5.68E-03	1.36E-02	1.36E-02	3.09E-02	0.57	RD3234	U
U-238DA	1.89E-01	7.16E-02	7.64E-02	1.83E-02	0.57	RD3234	
K-40	5.37E+00	4.09E-01	6.75E-01	N/A	N/A	RD3219	
CO-60	6.98E-03	1.11E-02	1.11E-02	2.00E-02	N/A	RD3219	U
EU-152	2.20E-02	5.11E-02	5.11E-02	9.10E-02	N/A	RD3219	U
CS-137DA	9.74E-01	4.58E-02	1.08E-01	N/A	N/A	RD3219	
CS-134	-4.47E-03	1.63E-02	1.63E-02	2.57E-02	N/A	RD3219	U
RU-106DA	-6.97E-02	1.66E-01	1.66E-01	2.61E-01	N/A	RD3219	U
RA-224DA	2.34E-01	6.77E-02	7.17E-02	N/A	N/A	RD3219	
NA-22	3.09E-03	1.22E-02	1.22E-02	2.09E-02	N/A	RD3219	U
EU-155	-5.67E-03	1.42E-01	1.42E-01	2.34E-01	N/A	RD3219	U
U-238DA	1.93E-01	6.98E-02	7.24E-02	N/A	N/A	RD3219	
BE-7	2.70E+00	5.37E-01	6.01E-01	N/A	N/A	RD3219	
EU-154	1.28E-02	3.30E-02	3.30E-02	5.69E-02	N/A	RD3219	U
TL-208	4.25E-02	3.53E-02	3.55E-02	N/A	N/A	RD3219	
PB-212	2.19E-01	6.33E-02	6.70E-02	N/A	N/A	RD3219	
PB-214	1.93E-01	6.98E-02	7.24E-02	N/A	N/A	RD3219	
TH-232DA	1.85E-01	8.70E-02	8.90E-02	N/A	N/A	RD3219	
I-129LP	1.19E+00	2.32E+00	2.32E+00	3.86E+00	N/A	RD3219	U
ALPHA	1.09E+00	2.13E+00	2.13E+00	3.86E+00	1	RD3222	U
BETA	4.22E+03	4.20E+01	2.82E+02	2.83E+00	1	RD3222	
TOTAL-SR	1.38E+03	1.01E+01	3.47E+02	8.20E-01	0.921	RD3204	
SE-79	2.66E+00	6.36E-01	1.83E+00	1.35E+00	0.772	RD3253	
TC-99	1.17E+02	1.16E+00	1.33E+01	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	7.52E-01	N/A	1.13E-01	5.02E-03	0.781	RD4200	

6/24/94

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682A-6-93

009

9613475.1230

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0022
LAB SAMPLE ID: 4-03-542-01
MATRIX: VEGETATION
WHC ID: BOBFM0
DATE RECEIVED 3/24/94
REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	4.73E-03	1.03E-02	1.03E-02	2.07E-02	0.64	RD3302	UJ
CM-242	-5.73E-04	1.15E-03	1.15E-03	2.88E-02	0.64	RD3302	UJ
CM-244	-1.24E-03	1.44E-03	1.45E-03	2.58E-02	0.64	RD3302	UJ
NP-237	4.62E-03	9.23E-03	9.29E-03	1.04E-02	0.832	RD3208	UJ
PU239/40	2.28E-02	2.28E-02	2.31E-02	1.55E-02	0.712	RD3209	
PU-238	-2.29E-03	3.24E-03	3.25E-03	3.23E-02	0.712	RD3209	U
U-234	3.24E-01	1.00E-01	1.11E-01	4.72E-02	0.518	RD3234	
U-235	1.40E-02	2.16E-02	2.17E-02	3.48E-02	0.518	RD3234	U
U-238DA	2.29E-01	8.35E-02	9.00E-02	2.06E-02	0.518	RD3234	
CS-134	3.61E-03	1.53E-02	1.53E-02	2.57E-02	N/A	RD3219	U
CS-137DA	1.72E+01	1.34E-01	1.73E+00	N/A	N/A	RD3219	
CO-60	3.85E-03	9.60E-03	9.61E-03	1.70E-02	N/A	RD3219	U
K-40	3.76E+00	3.36E-01	5.04E-01	N/A	N/A	RD3219	
EU-152	8.52E-03	4.81E-02	4.81E-02	8.38E-02	N/A	RD3219	U
EU-154	-2.25E-02	3.18E-02	3.19E-02	5.04E-02	N/A	RD3219	U
EU-155	2.03E-02	7.99E-02	7.99E-02	1.22E-01	N/A	RD3219	U
RU-106DA	-1.24E-01	1.64E-01	1.64E-01	2.56E-01	N/A	RD3219	U
RA-224DA	6.86E-02	4.38E-02	4.43E-02	N/A	N/A	RD3219	
NA-22	-8.27E-03	1.17E-02	1.17E-02	1.85E-02	N/A	RD3219	U
BE-7	2.30E+00	7.39E-01	7.73E-01	N/A	N/A	RD3219	
PB-212	6.43E-02	4.10E-02	4.15E-02	N/A	N/A	RD3219	
TH-232DA	1.52E-01	6.34E-02	6.52E-02	N/A	N/A	RD3219	
I-129LP	-4.94E-01	1.06E+00	1.07E+00	1.76E+00	N/A	RD3219	U
ALPHA	3.35E+00	2.94E+00	2.96E+00	3.85E+00	1	RD3222	U
BETA	8.79E+02	1.92E+01	6.11E+01	2.83E+00	1	RD3222	
TOTAL-SR	4.92E+02	6.58E+00	1.13E+02	4.52E-01	0.593	RD3204	J
SE-79	1.44E+00	5.72E-01	1.59E+00	1.16E+00	0.772	RD3253	
TC-99	4.95E+01	7.60E-01	6.08E+00	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	7.82E-01	N/A	1.17E-01	5.02E-03	0.781	RD4200	

6/24/94

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682A-6-93

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9613475.1231

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-02 MATRIX: VEGETATION

WHC ID: BOBFM1 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	-9.12E-04	1.29E-03	1.30E-03	2.60E-02	0.59	RD3302	U
CM-242	0.00E+00	0.00E+00	2.38E-02	2.15E-02	0.59	RD3302	U
CM-244	-4.60E-04	9.19E-04	9.22E-04	2.31E-02	0.59	RD3302	U
NP-237	0.00E+00	0.00E+00	0.00E+00	1.15E-02	0.832	RD3208	UJ
PU239/40	1.11E-02	1.58E-02	1.58E-02	1.51E-02	0.76	RD3209	UJ
PU-238	1.12E-02	1.58E-02	1.59E-02	1.51E-02	0.76	RD3209	U
U-234	1.86E-01	8.91E-02	9.39E-02	5.60E-02	0.393	RD3234	
U-235	6.29E-03	2.13E-02	2.13E-02	5.93E-02	0.393	RD3234	U
U-238DA	1.45E-01	7.85E-02	8.19E-02	4.79E-02	0.393	RD3234	
K-40	3.43E+00	3.92E-01	5.21E-01	N/A	N/A	RD3219	
CO-60	1.13E-02	1.13E-02	1.14E-02	2.07E-02	N/A	RD3219	U
EU-152	9.58E-02	5.61E-02	5.69E-02	1.06E-01	N/A	RD3219	U
CS-137DA	6.32E+00	8.36E-02	6.38E-01	N/A	N/A	RD3219	
CS-134	-1.02E-02	1.35E-02	1.35E-02	2.18E-02	N/A	RD3219	U
RU-106DA	-6.16E-02	1.43E-01	1.43E-01	2.34E-01	N/A	RD3219	U
RA-224DA	4.94E-02	4.41E-02	4.43E-02	N/A	N/A	RD3219	
NA-22	1.22E-02	1.17E-02	1.18E-02	2.14E-02	N/A	RD3219	U
EU-155	9.52E-03	6.98E-02	6.98E-02	1.15E-01	N/A	RD3219	U
BE-7	2.21E+00	6.54E-01	6.90E-01	N/A	N/A	RD3219	
EU-154	3.32E-02	3.18E-02	3.20E-02	5.81E-02	N/A	RD3219	U
TL-208	3.70E-02	1.96E-02	1.99E-02	N/A	N/A	RD3219	
PB-212	4.63E-02	4.13E-02	4.15E-02	N/A	N/A	RD3219	
TH-232DA	1.18E-01	5.05E-02	5.19E-02	N/A	N/A	RD3219	
I-129LP	-1.23E+00	1.25E+00	1.26E+00	2.05E+00	N/A	RD3219	U
ALPHA	-5.43E-01	1.09E+00	1.09E+00	3.64E+00	1	RD3222	U
BETA	6.14E+02	1.61E+01	4.36E+01	2.87E+00	1	RD3222	
TOTAL-SR	4.26E+02	2.97E+00	9.49E+01	2.19E-01	0.487	RD3204	J
SE-79	1.85E+00	6.04E-01	1.71E+00	1.22E+00	0.772	RD3253	
TC-99	4.68E+01	7.42E-01	5.79E+00	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	6.13E-01	N/A	9.19E-02	5.02E-03	0.781	RD4200	

6/24/94

~~0012~~

682A-6-93
011

9613475.1232

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-03 MATRIX: VEGETATION

WHC ID: BOBFM2 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	9.78E-03	1.38E-02	1.39E-02	1.32E-02	0.67	RD3302	U
CM-242	0.00E+00	0.00E+00	2.04E-02	1.84E-02	0.67	RD3302	U
CM-244	4.93E-03	9.85E-03	9.89E-03	1.33E-02	0.67	RD3202	U
NP-237	4.94E-03	9.87E-03	9.93E-03	1.11E-02	0.832	RD3208	UJ
PU239/40	2.39E-02	2.39E-02	2.42E-02	1.62E-02	0.667	RD3209	
PU-238	-2.39E-03	3.39E-03	3.41E-03	3.38E-02	0.667	RD3209	U
U-234	1.17E-02	3.11E-02	3.11E-02	7.67E-02	0.278	RD3234	U
U-235	-4.92E-03	4.92E-03	5.00E-03	8.21E-02	0.278	RD3234	UJ
U-238DA	7.20E-02	6.89E-02	7.02E-02	8.21E-02	0.278	RD3234	U
K-40	5.29E+00	4.87E-01	7.19E-01	N/A	N/A	RD3219	
CO-60	1.10E-02	1.19E-02	1.20E-02	2.19E-02	N/A	RD3219	U
EU-152	2.09E-02	5.67E-02	5.67E-02	9.87E-02	N/A	RD3219	U
CS-137DA	5.79E-01	3.01E-02	6.53E-02	N/A	N/A	RD3219	
CS-134	-3.65E-03	1.12E-02	1.12E-02	1.78E-02	N/A	RD3219	U
RU-106DA	1.21E-01	1.01E-01	1.02E-01	1.77E-01	N/A	RD3219	U
NA-22	-5.87E-03	1.44E-02	1.44E-02	2.42E-02	N/A	RD3219	U
EU-155	1.12E-02	2.62E-02	2.62E-02	4.44E-02	N/A	RD3219	U
BE-7	2.02E+00	3.87E-01	4.36E-01	N/A	N/A	RD3219	
EU-154	-1.60E-02	3.91E-02	3.91E-02	6.56E-02	N/A	RD3219	U
AC-228	4.14E-02	7.80E-02	7.81E-02	N/A	N/A	RD3219	
U-238DA	1.34E-01	4.27E-02	4.47E-02	N/A	N/A	RD3219	
PB-212	4.51E-02	3.11E-02	3.14E-02	N/A	N/A	RD3219	
PB-214	1.34E-01	4.27E-02	4.47E-02	N/A	N/A	RD3219	
RA-228DA	4.23E-02	7.97E-02	7.98E-02	N/A	N/A	RD3219	
I-129LP	-7.08E-02	3.61E-01	3.61E-01	6.29E-01	N/A	RD3219	U
ALPHA	2.71E-01	2.19E+00	2.19E+00	4.64E+00	1	RD3222	U
BETA	2.48E+01	3.54E+00	3.90E+00	2.71E+00	1	RD3222	
TOTAL-SR	1.04E+01	4.16E-01	2.45E+00	1.72E-01	0.628	RD3204	J
SE-79	4.90E-01	5.80E-01	1.56E+00	1.22E+00	0.772	RD3253	UJ
TC-99	2.94E+01	6.09E-01	3.95E+00	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	1.26E-01	N/A	1.89E-02	5.02E-03	0.781	RD4200	

6/24/94

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9613475.1233

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-03-542-04 MATRIX: VEGETATION

WHC ID: BOBFM3 DATE RECEIVED 3/24/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	1.30E-02	1.92E-02	1.94E-02	2.73E-02	0.524	RD3302	UJ
CM-242	-1.51E-03	2.14E-03	2.16E-03	4.32E-02	0.524	RD3302	UJ
CM-244	0.00E+00	0.00E+00	2.05E-02	1.85E-02	0.524	RD3202	UJ
NP-237	4.62E-03	9.23E-03	9.29E-03	1.04E-02	0.832	RD3208	UJ
PU239/40	1.61E-02	2.05E-02	2.06E-02	3.44E-02	0.815	RD3209	UJ
PU-238	9.04E-03	1.44E-02	1.44E-02	2.41E-02	0.815	RD3209	U
U-234	8.00E-02	5.97E-02	6.11E-02	5.95E-02	0.398	RD3234	
U-235	-2.53E-03	2.92E-03	2.95E-03	5.25E-02	0.398	RD3234	U
U-238DA	5.01E-02	4.72E-02	4.79E-02	5.25E-02	0.398	RD3234	U
K-40	3.58E+00	3.94E-01	5.32E-01	N/A	N/A	RD3219	
CO-60	1.27E-02	9.55E-03	9.63E-03	1.85E-02	N/A	RD3219	U
EU-152	5.82E-02	5.16E-02	5.19E-02	9.52E-02	N/A	RD3219	U
CS-137DA	6.11E-01	2.96E-02	6.79E-02	N/A	N/A	RD3219	
CS-134	-2.99E-03	9.51E-03	9.51E-03	1.57E-02	N/A	RD3219	U
RU-106DA	1.15E-01	8.77E-02	8.84E-02	1.59E-01	N/A	RD3219	U
RA-224DA	4.79E-02	3.27E-02	3.30E-02	N/A	N/A	RD3219	
NA-22	-5.85E-03	1.17E-02	1.17E-02	1.94E-02	N/A	RD3219	U
EU-155	-4.48E-03	2.58E-02	2.58E-02	4.05E-02	N/A	RD3219	U
TH-234	2.63E+00	1.22E+01	1.22E+01	N/A	N/A	RD3219	
BE-7	2.61E+00	3.42E-01	4.30E-01	N/A	N/A	RD3219	
EU-154	-1.59E-02	3.18E-02	3.19E-02	5.30E-02	N/A	RD3219	U
TL-208	7.74E-03	1.95E-02	1.95E-02	N/A	N/A	RD3219	
PB-212	4.48E-02	3.06E-02	3.09E-02	N/A	N/A	RD3219	
I-129LP	9.38E-02	2.76E-01	2.77E-01	4.87E-01	N/A	RD3219	U
ALPHA	-4.52E-01	2.02E+00	2.02E+00	4.87E+00	1	RD3222	U
BETA	3.54E+01	4.16E+00	4.77E+00	2.89E+00	1	RD3222	
TOTAL-SR	1.00E+01	3.81E-01	2.42E+00	1.50E-01	0.747	RD3204	J
SE-79	5.08E-01	5.73E-01	1.55E+00	1.21E+00	0.772	RD3253	UJ
TC-99	2.87E+01	6.08E-01	3.88E+00	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	1.06E-01	N/A	1.58E-02	5.02E-03	0.781	RD4200	

6/24/94

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9613475.1234

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-03 MATRIX: VEGETATION

WHC ID: BOBKN1 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	-4.67E-04	9.34E-04	9.37E-04	2.35E-02	0.613	RD3302	UJ
CM-242	-5.92E-04	1.19E-03	1.19E-03	2.98E-02	0.613	RD3302	UJ
CM-244	-1.41E-03	1.63E-03	1.64E-03	2.93E-02	0.613	RD3202	UJ
NP-237	4.39E-03	8.79E-03	8.84E-03	9.89E-03	0.832	RD3208	UJ
PU239/40	9.04E-03	1.44E-02	1.44E-02	2.41E-02	0.842	RD3209	UJ
PU-238	5.03E-03	1.01E-02	1.01E-02	1.36E-02	0.842	RD3209	U
U-234	4.84E-02	4.13E-02	4.19E-02	4.19E-02	0.477	RD3234	
U-235	-2.02E-03	2.33E-03	2.35E-03	4.19E-02	0.477	RD3234	U
U-238DA	2.46E-02	2.92E-02	2.94E-02	3.38E-02	0.477	RD3234	U
K-40	6.37E+00	4.79E-01	7.97E-01	N/A	N/A	RD3219	
CO-60	2.26E-02	1.34E-02	1.36E-02	2.52E-02	N/A	RD3219	U
EU-152	-1.52E-03	5.63E-02	5.63E-02	9.77E-02	N/A	RD3219	U
CS-137DA	1.18E-01	2.46E-02	2.73E-02	N/A	N/A	RD3219	
CS-134	-3.47E-03	1.01E-02	1.01E-02	1.66E-02	N/A	RD3219	U
RU-106DA	5.92E-02	1.03E-01	1.03E-01	1.74E-01	N/A	RD3219	U
RA-224DA	4.46E-02	3.04E-02	3.07E-02	N/A	N/A	RD3219	
NA-22	-1.86E-03	1.45E-02	1.45E-02	2.41E-02	N/A	RD3219	U
EU-155	1.78E-02	3.42E-02	3.42E-02	5.71E-02	N/A	RD3219	U
BE-7	1.57E+00	2.55E-01	2.99E-01	N/A	N/A	RD3219	
EU-154	-5.11E-03	3.99E-02	3.99E-02	6.69E-02	N/A	RD3219	U
TL-208	1.06E-02	2.54E-02	2.54E-02	N/A	N/A	RD3219	
PB-212	4.28E-02	2.91E-02	2.94E-02	N/A	N/A	RD3219	
TH-232DA	4.46E-02	8.51E-02	8.52E-02	N/A	N/A	RD3219	
I-129LP	1.47E-01	5.77E-01	5.77E-01	1.01E+00	N/A	RD3219	U
ALPHA	-5.43E-01	1.09E+00	1.09E+00	3.64E+00	1	RD3222	U
BETA	1.17E+02	7.17E+00	1.06E+01	2.87E+00	1	RD3222	
TOTAL-SR	5.23E+02	2.78E+00	1.24E+02	1.58E-01	0.705	RD3204	J
SE-79	6.68E-01	5.85E-01	1.58E+00	1.22E+00	0.772	RD3253	UJ
TC-99	5.34E+00	3.54E-01	1.52E+00	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	6.38E-02	N/A	9.60E-03	5.02E-03	0.781	RD4200	

6/24/94

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682A-6-93

9613475.1235

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-01 MATRIX: VEGETATION

WHC ID: BOBKN2 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	2.02E-02	2.02E-02	2.05E-02	1.37E-02	0.695	RD3302	
CM-242	0.00E+00	0.00E+00	1.92E-02	1.73E-02	0.695	RD3302	U
CM-244	-4.06E-04	8.12E-04	8.15E-04	2.04E-02	0.695	RD3202	U
NP-237	0.00E+00	0.00E+00	0.00E+00	1.13E-02	0.832	RD3208	UJ
PU239/40	7.48E-02	4.32E-02	4.46E-02	1.69E-02	0.643	RD3209	
PU-238	3.74E-03	1.30E-02	1.30E-02	3.53E-02	0.643	RD3209	U
U-234	1.04E-01	6.89E-02	7.10E-02	7.52E-02	0.376	RD3234	
U-235	8.70E-03	2.08E-02	2.09E-02	4.73E-02	0.376	RD3234	U
U-238DA	1.34E-01	7.47E-02	7.79E-02	4.17E-02	0.376	RD3234	
K-40	6.78E+00	1.33E+00	1.49E+00	N/A	N/A	RD3219	
CO-60	-3.27E-02	4.10E-02	4.11E-02	6.46E-02	N/A	RD3219	U
EU-152	2.84E-01	1.72E-01	1.74E-01	3.30E-01	N/A	RD3219	U
CS-137DA	1.67E+00	1.00E-01	1.95E-01	N/A	N/A	RD3219	
CS-134	2.55E-02	3.88E-02	3.88E-02	6.55E-02	N/A	RD3219	U
RU-106DA	-9.44E-02	3.69E-01	3.69E-01	6.01E-01	N/A	RD3219	U
RA-224DA	2.68E-01	1.43E-01	1.46E-01	N/A	N/A	RD3219	
NA-22	-1.20E-02	4.56E-02	4.56E-02	7.36E-02	N/A	RD3219	U
EU-155	7.25E-02	1.43E-01	1.43E-01	2.38E-01	N/A	RD3219	U
U-238DA	4.71E-01	1.53E-01	1.60E-01	N/A	N/A	RD3219	
EU-154	-3.32E-02	1.26E-01	1.26E-01	2.02E-01	N/A	RD3219	U
TL-208	1.65E-01	6.36E-02	6.57E-02	N/A	N/A	RD3219	
PB-212	2.57E-01	1.38E-01	1.40E-01	N/A	N/A	RD3219	
PB-214	4.71E-01	1.53E-01	1.60E-01	N/A	N/A	RD3219	
TH-232DA	4.64E-01	1.96E-01	2.02E-01	N/A	N/A	RD3219	
I-129LP	-3.62E-02	1.17E+00	1.17E+00	1.97E+00	N/A	RD3219	U
ALPHA	7.42E+00	4.00E+00	4.08E+00	3.86E+00	1	RD3222	
BETA	2.35E+02	1.00E+01	1.85E+01	2.82E+00	1	RD3222	
TOTAL-SR	2.95E+02	2.45E+00	6.60E+01	2.17E-01	0.493	RD3204	J
SE-79	9.29E-02	5.23E-01	1.39E+00	1.12E+00	0.772	RD3253	UJ
TC-99	2.35E+01	6.33E-01	3.31E+00	6.90E-01	0.951	ITAS-IT-RS-0001	
URANIUM	5.31E-01	N/A	7.97E-02	5.02E-03	0.781	RD4200	

6/24/94

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9613475.1236

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-04 MATRIX: VEGETATION

WHC ID: BOBKN3 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	2.11E-02	2.16E-02	2.19E-02	2.17E-02	0.616	RD3302	U
CM-242	-5.47E-04	1.09E-03	1.10E-03	2.75E-02	0.616	RD3302	U
CM-244	-8.67E-04	1.23E-03	1.23E-03	2.47E-02	0.616	RD3202	U
NP-237	0.00E+00	0.00E+00	0.00E+00	1.15E-02	0.832	RD3208	UJ
PU239/40	4.99E-03	9.97E-03	1.00E-02	1.35E-02	0.807	RD3209	UJ
PU-238	-2.00E-03	2.82E-03	2.84E-03	2.82E-02	0.807	RD3209	U
U-234	4.91E-02	3.80E-02	3.86E-02	3.28E-02	0.561	RD3234	
U-235	-2.30E-03	2.30E-03	2.32E-03	3.83E-02	0.561	RD3234	U
U-238DA	6.29E-02	4.31E-02	4.40E-02	3.58E-02	0.561	RD3234	
K-40	6.65E+00	4.94E-01	8.28E-01	N/A	N/A	RD3219	
CO-60	1.20E-02	1.24E-02	1.25E-02	2.30E-02	N/A	RD3219	U
EU-152	7.66E-02	5.32E-02	5.37E-02	1.04E-01	N/A	RD3219	U
CS-137DA	7.23E-02	2.71E-02	2.80E-02	N/A	N/A	RD3219	
CS-134	-3.63E-03	1.27E-02	1.27E-02	2.10E-02	N/A	RD3219	U
RU-106DA	9.20E-02	1.23E-01	1.24E-01	2.12E-01	N/A	RD3219	U
RA-224DA	1.33E-02	4.17E-02	4.17E-02	N/A	N/A	RD3219	
NA-22	-2.96E-03	1.28E-02	1.28E-02	2.15E-02	N/A	RD3219	U
EU-155	-2.97E-02	7.70E-02	7.71E-02	1.19E-01	N/A	RD3219	U
BE-7	2.58E+00	3.36E-01	4.24E-01	N/A	N/A	RD3219	
EU-154	-8.14E-03	3.51E-02	3.51E-02	5.87E-02	N/A	RD3219	U
TL-208	9.33E-03	2.60E-02	2.61E-02	N/A	N/A	RD3219	
PB-212	1.28E-02	3.99E-02	4.00E-02	N/A	N/A	RD3219	
I-129LP	-3.33E-01	3.99E-01	4.00E-01	6.55E-01	N/A	RD3219	U
ALPHA	2.08E+00	2.84E+00	2.85E+00	4.64E+00	1	RD3222	U
BETA	7.21E+02	1.74E+01	5.06E+01	2.72E+00	1	RD3222	
TOTAL-SR	6.69E+01	9.25E-01	1.64E+01	1.37E-01	0.841	RD3204	J
SE-79	1.21E+00	5.78E-01	1.59E+00	1.18E+00	0.772	RD3253	
TC-99	3.61E+01	6.70E-01	4.66E+00	6.12E-01	0.951	ITAS-IT-RS-0001	
URANIUM	1.56E-01	N/A	2.34E-02	5.02E-03	0.781	RD4200	

4/24/94

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9613475.1237

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: 4-04-120-02 MATRIX: VEGETATION

WHC ID: BOBKN4 DATE RECEIVED 4/4/94

REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
AM-241	3.53E-02	3.38E-02	3.44E-02	4.02E-02	0.459	RD3302	U
CM-242	-7.65E-04	1.53E-03	1.54E-03	3.85E-02	0.459	RD3302	U
CM-244	-6.07E-04	1.21E-03	1.22E-03	3.05E-02	0.459	RD3202	U
NP-237	1.02E-02	1.44E-02	1.46E-02	1.15E-02	0.832	RD3208	UJ
PU239/40	3.56E-02	3.07E-02	3.11E-02	3.94E-02	0.73	RD3209	UJ
PU-238	-1.15E-03	2.30E-03	2.30E-03	2.75E-02	0.73	RD3209	U
U-234	2.55E-01	1.16E-01	1.25E-01	7.34E-02	0.316	RD3234	
U-235	-4.16E-03	4.16E-03	4.22E-03	6.93E-02	0.316	RD3234	U
U-238DA	1.91E-01	1.01E-01	1.06E-01	6.93E-02	0.316	RD3234	
K-40	5.27E+00	1.52E+00	1.61E+00	N/A	N/A	RD3219	
CO-60	-1.55E-02	4.57E-02	4.57E-02	7.44E-02	N/A	RD3219	U
EU-152	2.29E-01	1.69E-01	1.70E-01	3.36E-01	N/A	RD3219	U
CS-137DA	1.11E+00	9.92E-02	1.49E-01	N/A	N/A	RD3219	
CS-134	1.47E-02	4.23E-02	4.23E-02	7.05E-02	N/A	RD3219	U
RU-106DA	-2.05E-01	4.32E-01	4.33E-01	6.98E-01	N/A	RD3219	U
RA-224DA	3.01E-01	1.32E-01	1.36E-01	N/A	N/A	RD3219	
NA-22	5.92E-03	4.15E-02	4.15E-02	7.34E-02	N/A	RD3219	U
EU-155	7.56E-02	1.67E-01	1.68E-01	2.79E-01	N/A	RD3219	U
TH-234	1.84E+01	2.30E+01	2.31E+01	N/A	N/A	RD3219	
BE-7	1.80E+00	8.79E-01	8.98E-01	N/A	N/A	RD3219	
EU-154	1.63E-02	1.14E-01	1.14E-01	2.02E-01	N/A	RD3219	U
PB-212	2.89E-01	1.27E-01	1.31E-01	N/A	N/A	RD3219	
I-129LP	2.97E-02	1.02E+00	1.02E+00	1.70E+00	N/A	RD3219	U
ALPHA	5.88E+00	3.69E+00	3.74E+00	4.05E+00	1	RD3222	
BETA	4.17E+02	1.33E+01	3.05E+01	2.96E+00	1	RD3222	
TOTAL-SR	4.91E+02	3.20E+00	1.09E+02	2.23E-01	0.475	RD3204	J
SE-79	5.98E-01	5.49E-01	1.49E+00	1.15E+00	0.772	RD3253	UJ
TC-99	4.55E+01	8.36E-01	5.62E+00	6.90E-01	0.951	ITAS-IT-RS-0001	
URANIUM	4.68E-01	N/A	7.02E-02	5.02E-03	0.781	RD4200	

6/24/94

9613475.1238

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

May 28, 1994

Attention: J.A.Lerch

SAF Number	:	94-065
Date SDG Closed	:	April 7, 1994
Number of Samples	:	Ten (10)
Sample Type	:	Vegetation
SDG Number	:	W0022
Data Deliverable	:	Stand-Alone

I. Introduction

On March 24, and April 7, 1994, ten vegetation 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
403542-01A	B0BFM0	Vegetation	3/24/94
403542-02A	B0BFM1	Vegetation	3/24/94
403542-03A	B0BFM2	Vegetation	3/24/94
403542-04A	B0BFM3	Vegetation	3/24/94
403542-05A	B0BFL8	Vegetation	3/24/94
403542-06A	B0BFL9	Vegetation	3/24/94
404120-01A	B0BKN2	Vegetation	4/7/94
404120-02A	B0BKN4	Vegetation	4/7/94
404120-03A	B0BKN1	Vegetation	4/7/94
404120-04A	B0BKN3	Vegetation	4/7/94

6/23/94

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

IT Corporation is a wholly owned subsidiary of International Technology Corporation

II. Analytical Results/Methodology

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

The requested analyses were:

Alpha Spectroscopy
Americium-241, Curium-244 by method ITAS-RD-3302
Neptunium-237 by method ITAS-RD-3208
Plutonium-238, 239/40 by method ITAS-RD-3209
Uranium-234, 235, 238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
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
Selenium-79 by method ITAS-RD-3253
Technetium-99 by method ITAS-IT-RS-0001
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0022 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate.

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

IV. Comments

The initial radioactivity screening of the samples classified them as Category I with the exceptions of WHC samples B0BKN1 and B0BKN3 which were classified as Category II.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The LCS, batch blank, sample and sample duplicate results are within contractual requirements and are therefore acceptable.

Neptunium-237 by method ITAS-RD-3208
Two matrix spikes were analyzed with the batch and their average yield is used for yield correction. The LCS, batch blank, sample and sample duplicate results are acceptable.

Plutonium-238, -239/40 by method ITAS-RD-3209
The batch was reanalyzed due to the low yields achieved on the initial analysis. The reanalysis LCS, batch blank, sample and sample duplicate results are acceptable and reported.

Uranium-234, -235, -238 by method ITAS-RD-3234
The LCS and the batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit. The tracer yield for sample B0BFM2 did not meet the lower limit of 30%. The sample was reanalyzed and again the tracer yield was less than the 30% limit. The reanalysis LCS and batch blank are acceptable and also reported. The low tracer yield for sample B0BFM2 is attributed to a matrix effect and the reanalysis data is reported.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Due to the insufficient sample received for analysis the samples were counted for an extended count time of 1000 minutes using the maximum volume of sample available. The LCS and batch blank are within contractual requirements. Samples B0BKN2 and B0BKN4 did not meet the detection limit for Co-60, Eu-152, Eu-154, and Eu-155. The duplicate of sample B0BFL9 is within the 3 sigma control limit for all isotopes with the exception of Eu-152. The results are accepted with elevated detection limits.

RK 6/23/94

Iodine-129 by method ITAS-RD-3219
The LCS and batch blank are acceptable. The following samples were recounted for extended counting times in an attempt to achieve the required detection limit: B0BKN4, B0BFM0, B0BFM3, the duplicate of B0BFL8, and B0BFL9. The detection limits were achieved on the recounts with the exception of sample B0BFL9. The recount data are accepted and reported.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The gross alpha analysis was performed in two separate sets for this SDG. In both sets the LCS, batch blank, sample and sample duplicate results are acceptable.

Gross Beta by method ITAS-RD-3222
The gross beta analysis was performed in two separate sets for this SDG. In both sets the LCS and batch blank results are acceptable. The sample and sample duplicate results were outside the 3 sigma control limit in one set and acceptable in the other set. The unacceptable sample and sample duplicate were recounted with the recount results again outside of the 3 sigma control limit. The duplicate difference could possibly be attributed to the non-homogeneous nature of vegetation matrices. The original data are accepted and reported.

Strontium-90 by method ITAS-RD-3204
The batch blank result is acceptable. The LCS radiochemical recovery is biased high (136%). The high LCS result is believed to be possible cross-contamination from the high activity of samples in the batch (batch samples have activity at levels of up to 65 times the spike level). The sample results are acceptable with the exception of sample B0BFL9 and the duplicate of B0BFM0 which did not produce results in the initial analysis due to low carrier yields. Those two samples were reanalyzed using a reduced sample size and an acceptable result was produced for B0BFL9. The duplicate of B0BFM0 had a low carrier yield on the reanalysis and a result was not produced. The reanalysis LCS and batch blank results are acceptable.

Liquid Scintillation Counting

Selenium-79 by method ITAS-RD-3253
The LCS and batch blank results are acceptable. The matrix spike result for sample B0BFM0 and the matrix spike duplicate result are acceptable and their average chemical yield is used for batch yield corrections. The sample and sample duplicate results are within the 3 sigma control limit.

Technetium-99 by method ITAS-IT-RS-0001
An error in sample batching caused samples B0BKN2 and B0BKN4 to be batched with SDGs W0032 and W0033. The LCS, matrix spikes, batch blank, sample and sample duplicate results associated with these two samples are acceptable and reported. The sample results were not yield corrected by the matrix spike recoveries.

The results for the remaining samples in SDG W0022 analyzed separately from B0BKN2 and B0BKN4 are also acceptable. Two matrix spikes were analyzed with this set. The sample results were not yield corrected by the matrix spike recoveries. One matrix spike is not reported due to technician error during the sample preparation. The technician reported that the spike foamed profusely when peroxide was added to the beaker during the wet ashing step of the sample preparation. A significant quantity of the spike poured out of the beaker. The other matrix spike analyzed with the set is biased high (139%) due to the activity of the sample and the effect of the sample's activity on counting statistics. The spike level added was 67 pCi/g and the sample activity measured 300 pCi/g. The LCS, batch blank, sample and sample duplicate results are within contractual requirements and reported.

Total Uranium

Total Uranium by method ITAS-RD-4200
The LCS, batch blank, sample and sample duplicate results are acceptable. Two matrix spikes were analyzed with the batch and their average yield is used for yield correcting the sample results.

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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

6/23/94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006439

Collector R.T. Sickle

Company Contact C.A. Rowley

Telephone 372-3293

SAF No. ~~93-263~~ (Veg) 94-065

Project Designation 216-U-8 Vitrified Clay Pipeline

Sampling Locations 216-U-8 Crib

Ice Chest No.

Bill of Lading/Airbill No. NA

Offsite Property No. NA

Method of Shipment

Field Logbook No.

Shipped to ~~TMA~~ IT

SPECIAL INSTRUCTIONS

Possible Sample Hazards/Remarks Unknown

Special Handling and/or Storage Keep Cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBFM0	Veg.	03-07-94	1015	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
BOBFM0	Veg.	03-07-94	1015	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	
	3-24-94	0900	
			11:00

*Matrix

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

800 CPM
3-24-94

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006440

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293

SAF No. ~~93-263~~ (Veg) 94-C65
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib

Ice Chest No. 125
Bill of Lading/Airbill No. NA
Offsite Property No. NA

Method of Shipment Entry
Field Logbook No.

Shipped to ~~NTMA~~ IT
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4102 BOBFM1	Veg.	03-07-94	1015	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4202 BOBFM1	Veg.	03-07-94	1015	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3-15-94	1000	L.S. Edwards
R.T. Sickle	3-24-94	0900	Karen Attenberg 3-24-94
			1100

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

450 count CPM
3-24-94

9613475.1246

026

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006441

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) DKE 3/22/94 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. EO JEM
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment EMERY
Field Logbook No.
Shipped to ~~TMA~~ IT DKE 3/22/94
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4103 BOBFM2	Veg.	03-07-94	1030	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4203 BOBFM2	Veg.	03-07-94	1030	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	DL Edwards
[illegible]	3-24-94	0900	Karen Hottenlug FTAS 11:00 3-24-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

~~RHT~~ 3-24-94 <100 cpm
~~RHT~~ 3-24-94

9613475.1247

027

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006442

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. ~~93-263~~ (Veg) DLC 3/22/94 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No. C-WS 009
Bill of Lading/Airbill No. NA
Offsite Property No. NA
Method of Shipment Energy
Field Logbook No.
Shipped to ~~Weston~~ IT DLC 3/22/94
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

SPECIAL INSTRUCTIONS

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4104 BOBFM3	Veg.	03-07-94	1030	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4204 BOBFM3	Veg.	03-07-94	1030	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By
R.T. Sickle	3-15-94	1000	[illegible]
[illegible]	3-24-94	0900	Karen Hattenburg FTAS 3-24-94 11:00

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

Less than 100 cpm
[illegible]
3-24-94

9413475.1248

D9413475 820

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006492

Collector R.T. Sickle

Company Contact C.A. Rowley

Telephone 372-3293

SAF No. ~~93-263~~ (Veg) 94-065

Project Designation 216-U-8 Vitrified Clay Pipeline

Sampling Locations 216-U-8 Crib

Ice Chest No.

Bill of Lading/Airbill No. NA

Offsite Property No. NA

Method of Shipment

Field Logbook No.

Shipped to ~~TMA~~ IT

SPECIAL INSTRUCTIONS

Possible Sample Hazards/Remarks Unknown

Special Handling and/or Storage Keep Cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4105 BOBFL8	Veg.	03-07-94	0945	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4205 BOBFL8	Veg.	03-07-94	0945	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-15-94	1000	D.J. Edwards
D.J. Edwards	3-24-94	0900	Karen Ackterling IT 3-24-94 11:00

*Matrix

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

3-24-94 100 cpm 3-24-94

9613475.1249

9613475.0203

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006495

Collector R.T. Sickle
SAF No. ~~93-263~~ (Veg) DJC 3/22/94 94-065
Ice Chest No.
Method of Shipment
Shipped to ~~NETMA~~ IT DJC 3/22/94
Possible Sample Hazards/Remarks Unknown
Special Handling and/or Storage Keep Cool

Company Contact C.A. Rowley
Project Designation 216-U-8 Vitrified Clay Pipeline
Bill of Lading/Airbill No. NA

Telephone 372-3293
Sampling Locations 216-U-8 Crib
Offsite Property No. NA
Field Logbook No.

SPECIAL INSTRUCTIONS

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
4035 4106 BOBFL9	Veg.	03-07-94	1000	500ml Poly	Metals -CLP TAL Titanium Mercury CPL	
4035 4206 BOBFL9	Veg.	03-07-94	1000	Plastic bags	Gross Alpha/Beta EP-10; Gamma Spec. Cs-134/137, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 RC-30; Total Uranium EA-01C; U-235/234/238 EP-70, 71, 5; Np-237 RC-101A, 622, EP-5; Pu-238/239/240 EP-80, 81, 5; I-129 RC-25, 603; Sr-90 RC-306, 303, 309, 304; Tc-99 RC-24, 604; Am-241, Cm-244 EP-80, 91, 92, 93, 5; Se-79 Lab Specific	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle R.T. Sickle	3-15-94	1000	D.R. Edwards
D.R. Edwards	3-24-94	0900	Karen Holtenberg IT 3-24-94 1100

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

1300 counts
KH
3-24-94
11:00

9613475.1250

030

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006459

Collector R.T. Sickle
SAF No. 94-065
Ice Chest No.
Method of Shipment Government truck
Shipped to IT
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Company Contact C.A. Rowley
Project Designation 216-U-8 Vitrified Clay Pipeline
Bill of Lading/Airbill No. N/A

Telephone 372-3293
Sampling Locations 216-U-8 Crib
Offsite Property No.
Field Logbook No.

SPECIAL INSTRUCTIONS
VEGETATION

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN2	X8	03-29-94	1022	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury CPL	
BOBKN2	X8	03-29-94	1022	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[illegible]	3-30-94	0815	[illegible]
[illegible]	4-4-94	0900	[illegible] 11:15 4-4-94
			2100 [illegible]

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

4641200

9613475.1251

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006461

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN4	X8	03-29-94	1052	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury CPL	
BOBKN4	X8	03-29-94	1052	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3 31 94	0815	[illegible]
[illegible]	4-4-94	0900	Karen Lohtenberg IT 11:15

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9413475.1252

40412002

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006458

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS VEGETATION
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN1	X	03-29-94	1015	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury CPL	
BOBKN1	X	03-29-94	1015	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	3-31-94	0815	[illegible]
[illegible]	4-4-94	0900	[illegible]

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

4041203

9613475.1253

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006460

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

SPECIAL INSTRUCTIONS
VEGETATION

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKN3	XS	03-29-94	1048	(1) 250ml Poly	Metals -CLP TAL Titanium Mercury CPL	
BOBKN3	XS	03-29-94	1048	(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
[signature] RT Sickle	3-31-94	0815	[signature]
[signature]	4-4-94	0900	[signature] IT 4-4-94

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

9613475.1254

4042004

9613475.1395

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: W0022-ITC-035	
VALIDATOR: S. Schlicht	LAB: IT		DATE: 6/22/94
CASE: NA		SDG: W0022	

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX B0BFM0, 1, 2, 3, B0BFL8, 9, B0BKN1, 2, 3, 4/veg.

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: Det. ALP 123-132 no NIST traceability
Det. LSC3 and GER1 (Se) calibrated within 1 yr.
Det. GER6 and 7 (MA) calibrated within 1 yr. all
other calibrations >1 yr. No qualification.

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: Ref. ALP 6, 17, 18 not calibrated within 1 week of analysis (Am, Cm). Associated results qualified as estimated (J, UJ)

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:

5. Matrix Spikes . . . . . ☐ N/A

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

Comments:

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

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No ~~N/A~~ 6/22/94

Comments: If recovery >130%, associated detects qualified as estimated (J). ^{235}U recovery <70%, associated results qualified (UJ). ^{129}I recovery >130%, no associated detects, no qualification.

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 collected 3/7-3/29/94, analyses completed 5/28/94, holding time < 180 days

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: Eu-152, 154, 155, Tc-99, Co-60, RDLs exceeded, no qualification and I-129

Revised Page 4/27/94

9613475.1260

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

LABORATORY CONTROL SAMPLES

LAB NAME: ITAS-RICHLAND SDG NO.: W0022

LAB SAMPLE ID: L-03-542-1S 5/25/94

REPORTING UNIT pCi/g & ug/g 5/20/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
AM-241	4.58E+00	2.56E-01	6.86E-01	1.91E-02	1.015	4.52E+00	101
NP-237	6.94E+00	3.73E-01	1.54E+00	1.90E-02	0.832	5.64E+00	123
U-234	1.42E+00	1.98E-01	2.79E-01	4.07E-02	0.606	1.62E+00	88
U-235	7.28E-02	4.57E-02	4.67E-02	3.88E-02	0.606	7.37E-02	99
U-238DA	1.73E+00	2.18E-01	3.23E-01	4.25E-02	0.606	1.69E+00	102
ALPHA	4.41E+00	4.24E-01	8.55E-01	9.78E-02	1	4.51E+00	98
BETA	1.18E+01	1.07E+00	1.36E+00	6.13E-01	1	1.13E+01	104
TOTAL-SR	8.28E+00	3.20E-01	2.13E+00	1.27E-01	0.939	6.09E+00	136
SE-79	3.66E+01	1.06E+01	1.06E+01	N/A	0	4.54E+01	81
URANIUM	9.17E+00	N/A	1.38E+00	5.02E-03	0.781	1.02E+01	90

LAB SAMPLE ID: L-03-542-2S 5/27/94

REPORTING UNIT pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
PU239/40	3.88E+00	2.89E-01	5.73E-01	2.57E-02	0.775	3.38E+00	115
U-234	1.59E+00	2.60E-01	3.65E-01	5.27E-02	0.394	1.62E+00	98
U-235	4.87E-02	4.74E-02	4.81E-02	5.97E-02	0.394	7.39E-02	66
U-238DA	1.54E+00	2.56E-01	3.56E-01	2.86E-02	0.394	1.70E+00	91
TOTAL-SR	3.31E+01	1.56E+00	9.15E+00	7.91E-01	1	3.62E+01	91

6/23/94

~~0029~~

682A-6-93

9613475.1261

* highspike due possible x contamination from extremely high level samples.

DATE 25-May-94 CALCULATED RESULTS SUMMARY dir$era_caldat:403542-TSR PAGE 1

(NUM)	IT #	ISOTOPE	RESULT	ERROR*	COUNT ERROR*	YIELD	CALC MDA	UNITS	COMMENTS	DIAGNOSTICS
(1)	L035421B	SR	3.680E-02	2.492E-02	2.448E-02	0.936	1.27E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(2)	L035421B	SR	3.680E-02	2.492E-02	2.448E-02	0.936	1.27E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(3)	L035421S	SR	8.281E+00	1.064E+00	1.600E-01	0.939	1.27E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(4)	L035421S	SR	* 8.281E+00	1.064E+00	1.600E-01	0.939	1.27E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(5)	40354201	SR	4.916E+02	5.652E+01	3.289E+00	0.593	4.51E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(6)	40354201	SR	4.916E+02	5.652E+01	3.289E+00	0.593	4.51E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(7)	F0354201	SR	No Contr Values	Ppt Out Rng SR90					Ppt Out Rng Y90	
(8)	F0354201	SR	No Contr Values	Ppt Out Rng SR90					Ppt Out Rng Y90	
(9)	40354202	SR	4.255E+02	4.746E+01	1.486E+00	0.487	2.19E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(10)	40354202	SR	4.255E+02	4.746E+01	1.486E+00	0.487	2.19E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(11)	40354203	SR	1.044E+01	1.227E+00	2.080E-01	0.628	1.72E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(12)	40354203	SR	1.044E+01	1.227E+00	2.080E-01	0.628	1.72E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(13)	40354204	SR	1.001E+01	1.209E+00	1.904E-01	0.747	1.50E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(14)	40354204	SR	1.001E+01	1.209E+00	1.904E-01	0.747	1.50E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(15)	40354205	SR	3.282E+02	4.056E+01	1.019E+00	0.868	1.34E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(16)	40354205	SR	3.282E+02	4.056E+01	1.019E+00	0.868	1.34E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(17)	40354206	SR	No Contr Values	Ppt Out Rng SR90					Ppt Out Rng Y90	
(18)	40354206	SR	No Contr Values	Ppt Out Rng SR90					Ppt Out Rng Y90	
(19)	40412001	SR	2.951E+02	3.298E+01	1.223E+00	0.493	2.17E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(20)	40412001	SR	2.951E+02	3.298E+01	1.223E+00	0.493	2.17E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(21)	40412002	SR	4.914E+02	5.460E+01	1.601E+00	0.475	2.23E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(22)	40412002	SR	4.914E+02	5.460E+01	1.601E+00	0.475	2.23E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(23)	40412003	SR	5.233E+02	6.178E+01	1.390E+00	0.705	1.58E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values
(24)	40412003	SR	5.233E+02	6.178E+01	1.390E+00	0.705	1.58E-01	PCI/G	AVER Total Sr cal as 100% Sr9	No Contr Values
(25)	40412004	SR	6.689E+01	8.205E+00	4.623E-01	0.841	1.37E-01	PCI/G	Total Sr cal as 100% Sr90	No Contr Values

136 %

6.0884 ± .0875 EQGF006

Rerun

Rerun.

5/27/94

6/23/94

~~1490~~

04

9613475.1262


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(NUM) ----- RESULTS ------   ----- ERRORS -----        ALQ/TOT     NET SA       BKG       PPT 1    --- ISO EFF D/C ---  DECY
      DPM/ALQT  ACT/UNIT   CNT      RAN%   SY% UNIT    SIZE      C/M [MIN]   C/M [MIN]  [PPT 2]   1      2      3    [INGR] YIELD
-----------------------------------------------------------------------------------------------------------------------------------

==> L035422S  U234                          *** Diagnostics (Warning) > No Contr Values ***
( 11)  7.08E+00  1.59E+00 1.30E-01   11.1   2.8 PCI/G  2.000E+00     0.7538      0.0012          3.700                 1.000  0.394
     (8.07E-01)                                                      [  200]     [ 2500] [     ] (0.111)(     )(     )[0.000](0.000)

  AVERAGE  U234                             ---- PREVIOUS RESULT RANGE ----    ---------------- CONTRACT --------------
                                                LOW      HIGH    NUM EXCEED     Lc        CL       MIN VOL   AU    EXCEED
( 12)    1.594E+00 +- 1.825E-01 (1s) PCI/G                                     0.00E+00 0.00E+00 0.00E+00 0.00E+00 HIGH
                                                                                                          ---- CALCULATED ----
          B_FL  BLK (dpm)     LCL       UCL      NUM   EXCEEDS       ACT/DPM        FLOW (CMH)              Lc        DL
            N   0.000E+00   0.00E+00  0.00E+00   0    OK            2.2523E-01     1.0000E+00          1.205E-02 5.272E-02
              (0.0000E+00)                                          (2.2523E-03)

==> L035422S  U235                          *** Diagnostics (Warning) > No Contr Values ***
( 13)  2.16E-01  4.86E-02 2.37E-02   49.3   2.8 PCI/G  2.000E+00     0.0230      0.0020          3.700                 1.000  0.394
     (1.07E-01)                                                      [  200]     [ 2500] [     ] (0.111)(     )(     )[0.000](0.000)

  AVERAGE  U235                             ---- PREVIOUS RESULT RANGE ----    ---------------- CONTRACT --------------
                                                LOW      HIGH    NUM EXCEED     Lc        CL       MIN VOL   AU    EXCEED
( 14)    4.864E-02 +- 2.404E-02 (1s) PCI/G                                     0.00E+00 0.00E+00 0.00E+00 0.00E+00 HIGH
                                                                                                          ---- CALCULATED ----
          B_FL  BLK (dpm)     LCL       UCL      NUM   EXCEEDS       ACT/DPM        FLOW (CMH)              Lc        DL
            N   0.000E+00   0.00E+00  0.00E+00   0    OK            2.2523E-01     1.0000E+00          1.556E-02 5.973E-02
              (0.0000E+00)                                          (2.2523E-03)

==> L035422S  U238                          *** Diagnostics (Warning) > No Contr Values ***
( 15)  6.86E+00  1.54E+00 1.28E-01   11.2   2.8 PCI/G  2.000E+00     0.7300      0.0000          3.700                 1.000  0.394
     (7.88E-01)                                                      [  200]     [ 2500] [     ] (0.111)(     )(     )[0.000](0.000)

  AVERAGE  U238                             ---- PREVIOUS RESULT RANGE ----    ---------------- CONTRACT --------------
                                                LOW      HIGH    NUM EXCEED     Lc        CL       MIN VOL   AU    EXCEED
( 16)    1.544E+00 +- 1.781E-01 (1s) PCI/G                                     0.00E+00 0.00E+00 0.00E+00 0.00E+00 HIGH
                                                                                                          ---- CALCULATED ----
          B_FL  BLK (dpm)     LCL       UCL      NUM   EXCEEDS       ACT/DPM        FLOW (CMH)              Lc        DL
            N   0.000E+00   0.00E+00  0.00E+00   0    OK            2.2523E-01     1.0000E+00          0.000E+00 2.862E-02
              (0.0000E+00)                                          (2.2523E-03)

          Tracer...
==> 40354203  U232
( 17)  1.03E+01  2.37E+00 1.95E-01    2.9   2.8 PCI/G  1.950E+00     0.7716      0.0284          3.700                 1.000  0.278
     (4.04E-01)                                                      [  200]     [ 2500] [     ] (0.111)(     )(     )[0.000](0.000)

==> 40354203  U234                          *** Diagnostics (Warning) > No Contr Values ***
( 19)  5.06E-02  1.17E-02 1.55E-02  133.1   2.8 PCI/G  1.950E+00     0.0038      0.0012          3.700                 1.000  0.278
     (6.74E-02)                                                      [  200]     [ 2500] [     ] (0.111)(     )(     )[0.000](0.000)
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6/23/94

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W0022-ITC-035

Americium/Curium						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
Aliquot:	2.21E+00					
Am241 net cpm:	0.0046					
Am241 bkg cpm:	0.0004					
Spl count time:	200					
Bkg count time:	2500					
Eff d/c:	3.225					
Decay:	1					
Yield:	0.64					
Am241 calc:	4.72E-03					
Am241 rptd:	4.73E-03					
Am241 MDA calc:	2.07E-02					
Am241 MDA rptd:	2.07E-02					
Cm244 net cpm:	-0.0012					
Cm244 bkg cpm:	0.0012					
Cm244 decay:	1.008					
Cm244 calc:	-1.24E-03					
Cm244 rptd:	-1.24E-03					
Cm244 MDA calc:	2.58E-02					
Cm244 MDA rptd:	2.58E-02					
Cm242 net cpm:	-0.0004					
Cm242 bkg cpm:	0.0004					
Cm242 decay:	1.394					
Cm242 calc.:	-5.73E-04					
Cm242 rptd:	-5.73E-04					
Cm242 MDA calc:	2.88E-02					
Cm242 MDA rptd:	2.88E-02					
Neptunium						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
Aliquot:	2.17E+00					
Np237 net cpm:	0.005					
Np237 bkg cpm:	0					
Spl count time:	200					
Bkg count time:	2500					
Eff d/c:	3.7					
Decay:	1					
Yield:	0.832					
Np237 calc:	4.62E-03					
Np237 rptd:	4.62E-03					
Np237 MDA calc:	1.25E-02					
Np237 MDA rptd:	1.04E-02					

W0022-ITC-035

Plutonium						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
Aliquot:	2.05E+00					
Pu238 net cpm:	-0.002					
Pu238 bkg cpm:	0.002					
Spl count time:	200					
Bkg count time:	1000					
Pu238 Eff d/c:	3.703					
Decay:	1					
Yield:	0.712					
Pu238 calc:	-2.29E-03					
Pu238 rptd:	-2.29E-03					
Pu238 MDA calc:	3.23E-02					
Pu238 MDA rptd:	3.23E-02					
Pu239 net cpm:	0.02					
Pu239 bkg cpm:	0					
Pu239 d/c:	3.7					
Pu239 decay:	1					
Pu239 calc:	2.28E-02					
Pu239 rptd:	2.28E-02					
Pu239 MDA calc:	1.55E-02					
Pu239 MDA rptd:	3.23E-02					
Uranium						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
Aliquot:	2.11E+00					
U-234 net cpm:	0.2122					
U-234 bkg cpm:	0.0028					
Spl count time:	200					
Bkg count time:	2500					
Eff d/c:	3.7					
Decay:	1					
Yield:	0.518					
U-234 calc:	3.24E-01					
U-234 rptd:	3.24E-01					
U-234 MDA calc:	4.72E-02					
U-234 MDA rptd:	4.72E-02					
U-235 net cpm:	0.0092					
U-235 bkg cpm:	0.0008					
U-235 decay:	1					
U-235 calc:	1.40E-02					
U-235 rptd:	1.40E-02					
U-235 MDA calc:	3.48E-02					
U-235 MDA rptd:	3.48E-02					
U-238 net cpm:	0.15					
U-238 bkg cpm:	0					
U-238 decay:	1					
U-238 calc.:	2.29E-01					
U-238 rptd:	2.29E-01					
U-238 MDA calc:	2.07E-02					
U-238 MDA rptd:	2.06E-02					

W0022-ITC-035

Gross Alpha						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
Aliquot:	5.01E-02					
Net counts:	0.074					
Bkg counts:	0.026					
Spl count time:	100					
Bkg count time:	500					
d/c:	5.032					
Calc.:	3.35E+00					
Rptd:	3.35E+00					
MDA calc:	3.87E+00					
MDA rptd:	3.85E+00					
Gross Beta						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
Aliquot:	2.50E-01					
Net counts:	168.322					
Bkg counts:	0.998					
Spl count time:	50					
Bkg count time:	500					
d/c:	2.898					
Calc.:	8.79E+02					
Rptd:	8.79E+02					
MDA calc:	2.83E+00					
MDA rptd:	2.83E+00					
Strontium 90						
HEIS No.:	B0BFM0					
Sample:	40354201					
Sep date:	5/23/94					
Sep time:	16:00					
Count date:	5/24/94					
Count time:	9:15					
Hours:	17.25					
Sample amt:	6.07E+00					
Net, cpm:	2234.03					
Count time:	10					
Bkg, cpm:	0.972					
Count time:	500					
D/C 1:	2.096					
D/C 2:	1.803					
D/C 3:	1.852					
Yield:	0.593					
Calc:	4.91E+02					
Rptd:	4.92E+02					
MDA, Calc:	4.51E-01					
MDA, rptd:	4.52E-01					

W0022-ITC-035

Selenium 79						
HEIS No.:	B0BFM0					
Sample:	40354201					
Bkg cpm:	20.24					
Spl, amt:	1.07E+00					
Spl cpm:	22.44					
Count time:	100					
Spl dpm:	24.82					
d/c:	1.106					
Yield:	0.772					
Blk, dpm:	2.87E+01					
Calc:	1.43E+00					
Rptd:	1.44E+00					
MDA, calc:	1.28E+00					
MDA, rptd:	1.16E+00					
Technetium-99						
HEIS No.:	B0BFM0					
Sample:	40354201					
Bkg cpm:	27.23					
Spl, amt:	2.00E+00					
Spl cpm:	219.39					
Count time:	100					
Spl dpm:	237.74					
d/c:	1.084					
Yield:	0.951					
Blk, dpm:	3.01E+01					
Calc:	4.95E+01					
Rptd:	4.95E+01					
MDA, calc:	6.30E-01					
MDA, rptd:	1.16E+00					
Total Uranium						
HEIS No.:	B0BFM0					
Lab ID:	40354201					
ng, raw:	6.28E+00					
g, sample:	1.03E+00					
Dil. vol:	100					
Yield, corr:	0.7815					
Calc.:	7.81E-01					
Rptd:	7.82E-01					