GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Z1-TMA-636 (923-E418 636GEN.UP2)

9413225.2207

MEMORANDUM

MAR 1994
RECEIVED
TQO

TO: 200 UP-2 Project QA Record

March 7, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE B098Z1-TMA-636 (923-E418 636GEN.UP2)

INTRODUCTION

This memo presents the results of data validation on data package B098Z1-TMA-636 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Z1	10/11/93	SOIL	SEE NOTE 1
B098Z2	10/12/93	SOIL	
B098Z3	10/14/93	SOIL	
B098Z4	10/15/93	SOIL	
B098Z5	10/19/93	SOIL	
B098Z6	10/21/93	SOIL	
B098Z7	10/21/93	SOIL	
B098Z8	10/22/93	SOIL	
B098Z9	10/22/93	SOIL	
B09901	10/25/93	SOIL	
B09903	10/25/93	SOIL	

Notes:

1. Indicates the samples were analyzed for Nitrate/Nitrite as N.

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

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of eleven (11) samples were validated in this data package with a total of eleven determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

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.

9413225.2209

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9414225.2210

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9411225.2212

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B098Z1-TMA-636	REVIEWER: T. STAPP	DATE: 3-04-94	PAGE 1 OF 1
COMMENTS: WET CHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ALL NITRATE/NITRITE VALUES REPORTED AS LESS THAN (<)	U	B098Z6 B098Z7 B098Z8 B098Z9 B09901	QUALIFIER APPLIED TO BE CONSISTENT WITH NORMAL REPORTING PRACTICE

9413225.2213

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

9413025.2214

9413225.2215

Validated Data Summary, Data Package: B09821-1MA-636

	Samp#	B09821		B09822		B09823		B09824		B09825		B09826	
	Date	10-11-93		10-12-93		10-14-93		10-15-93		10-19-93		10-21-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
NITRATE+NITRITE-N	MG N/KG	12.300		35.700		55.300		24.100		117.000		2.500	U

Verified 95, 3-7-94

9413225.2216

Validated Data Summary, Data Package: B09BZ1-TMA-636

	Samp#	B09BZ7		B09BZ8		B09BZ9		B09901		B09903	
	Date	10-21-93		10-22-93		10-22-93		10-25-93		10-25-93	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
NITRATE+NITRITE-N	MG-N/KG	2.490	U	2.500	U	2.490	U	2.500	U	86.400	

Verified
RE 3-1-94

Skinner&Sherman REPORT

Work Order # S3-11-011

Received: 11/01/93

Results by Sample

Q

SAMPLE ID 309821 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 10/11/93 Category SOIL

NITR_S 12.3
mg N/kg

SAMPLE ID 309822 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 10/12/93 Category SOIL

NITR_S 35.7
mg N/kg

SAMPLE ID 309823 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 10/14/93 Category SOIL

NITR_S 55.3
mg N/kg

SAMPLE ID 309824 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 10/15/93 Category SOIL

NITR_S 24.1
mg N/kg

SAMPLE ID 309825 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 10/19/93 Category SOIL

NITR_S 117
mg N/kg

SAMPLE ID 309826 SAMPLE # 06 FRACTIONS: A
Date & Time Collected 10/21/93 Category SOIL

NITR_S <2.50
mg N/kg

U

SAMPLE ID 309827 SAMPLE # 07 FRACTIONS: A
Date & Time Collected 10/21/93 Category SOIL

NITR_S <2.49
mg N/kg

U

Verified 3-7-94

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

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

Received: 11/01/93

Results by Sample

Q

SAMPLE ID B09828 SAMPLE # 08 FRACTIONS: A
Date & Time Collected 10/22/93 Category SOIL

NITR_S <2.50 U
mg N/kg

SAMPLE ID B09829 SAMPLE # 09 FRACTIONS: A
Date & Time Collected 10/22/93 Category SOIL

NITR_S <2.49 U
mg N/kg

SAMPLE ID B09901 SAMPLE # 10 FRACTIONS: A
Date & Time Collected 10/25/93 Category SOIL

NITR_S <2.50 U
mg N/kg

SAMPLE ID B09903 SAMPLE # 11 FRACTIONS: A
Date & Time Collected 10/25/93 Category SOIL

NITR_S 86.4
mg N/kg

SAMPLE ID B09903D SAMPLE # 11 FRACTIONS: B
Date & Time Collected 10/25/93 Category SOIL

NITR_S 39.4
mg N/kg

SAMPLE ID B09903S SAMPLE # 11 FRACTIONS: C
Date & Time Collected 10/25/93 Category SOIL

NITR_S '09
mg N/kg

SAMPLE ID LCSS SAMPLE # 12 FRACTIONS: A
Date & Time Collected not specified Category SOIL

NITR_S 2.00
mg N/L

Verified 3-7-94

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

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

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

94/325.2219

Received: 11/01/93 Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

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

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 10-11-93

Ice Chest No.: KENT — Field Logbook No.: EFL-1091

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B098Z1
   1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
   1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
   ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3) RER 10-11-93
   ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
   ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
0920 Karen E. Rogers 10-28-93	[signature]	10-29-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

~~026~~ KS 3-7-94

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-12-93

Ice Chest No.: KENT

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09822

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

JEK 10-12-93

3)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
10-28-93 Leone E. Rogers 0920	[signature]	10-28-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

~~026B~~ 3-7-94

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-14-93

Ice Chest No.: SML-349

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B098Z3

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
10-28-93 Leane E. Rogers 0930		
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

~~0226~~ 3-7-94

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-14-93

Ice Chest No.: SML-349

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B098Z3
   1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
   1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
   ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
   LR 10-14-93

3) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
   1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

~~026~~ 3-7-94

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

Westinghouse Hanford Company

10-15-93

CHAIN OF CUSTODY

Custody Form Initiator ~~L E ROGERS~~ W.S. Thompson

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-15-93 TIME: 1051

Ice Chest No. SMH-349

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) 609874

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3)

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

[] Field Transfer of Custody

Chain of Possession		(Sign and Print Names)
Relinquished by: W.S. Thompson 1130 10-15-93	Received by: Ray T Gehle	Date/Time: 10-15-93 1130
Relinquished by: 10-25-93 0820 Ray T Gehle	Received by: 10-25-93 Loren E Rogers 0820	Date/Time: 10-25-93 0820
Relinquished by: 10-28-93 Loren E Rogers 0930	Received by: Denise Trasa/HLRCAL	Date/Time: 10-29-93 12:35
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

026H 3-7-94

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-19-93

Ice Chest No.: SML-349

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: WESTON

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09BZ5

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

2)

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

3) LER 10-19-93

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 10-20-93 0930	Received by: TNA/NCRIAL	Date/Time: 10-20-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

026J 3-7-94

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-21-93

Ice Chest No.: SMB-413

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09BZ6
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B09BZ7
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 10-21-93
- ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
10-28-93 Jerome E. Rogers 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

3-7-94

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 10-22-93

Ice Chest No.: SML-413 — Field Logbook No.: EFC-1091

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B098Z8
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B098Z9
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ EP 10-22-93
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

9413275.2228

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 10-28-93 Loren E. Rogers 0930	Received by: Louise TMA/NORCAL	Date/Time: 10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

026 N 3-7-94

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-25-93

Ice Chest No. SML-415

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL)

Sample Identification

1) B09901

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~B09902~~ B09903

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

~~0267~~ FC 3-7-94

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

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9413225.2230

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200 UP-2	DATA PACKAGE: B098Z1-TMA-636
VALIDATOR: T. Stapp / LAB: TMA / Skinner & Sh.	DATE: 3-3-94
CASE: N3-10-162	SDG: ~~N3-10-162~~

ANALYSES PERFORMED

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

SAMPLES/MATRIX B098Z1 B098Z2 B098Z3 B098Z4 B098Z5 B098Z6 B098Z7 B098Z8 B098Z9 B09901 B09903 / SOIL

9413225.2231

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 3-7-94

Comments: Performed by WHC

2. HOLDING TIMES

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

Comments: See HOLDING TIME SUMMARY on ~~page A-26 of checklist~~ from B-1 3-7-94

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

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

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

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

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

Comments:

4. BLANKS

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

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

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

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

Comments: Field QC, including field/trip blanks, were not identified at the time of this review. Field QC identification has been requested and will be included at the time of final data summary.

5. ACCURACY

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

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

Were LCS analyses performed at the required frequency? See Note. (Yes) No N/A

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

Comments: Raw data is not available for LCS. ~~All results are qualified "J" as estimated~~ No qualification has been applied. Reported results are acceptable.

3-7-

6. PRECISION

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

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

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

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

9413225.2232

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: Field QC including field duplicates/splits were not identified at the time of this review. Field QC identification has been requested and will be included at the time of final data summary

7. ANALYTE QUANTITATION

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

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

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

Do results meet the CRDLs? . ~~See note ①~~ . . . . . Yes No N/A 3-7-94

Comments:

~~① The CRQL of 0.1 mg/L is not satisfied for Soil Samples analyzed. Equivalent CRDL = 0.1 mg/kg No qualification applied.~~

3-7-94

HOLDING TIME SUMMARY

SDG: B098Z1-TMA-636	VALIDATOR: Tom Stapp	DATE: 3-7-94	PAGE 1 OF 1
COMMENTS: General Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B098Z1	NO_2/NO_3	10-11-93	11-2-93	11-3-93	22	23	NONE
Z2		10-12-93			21	22	
Z3		10-14-93			19	20	
Z4		10-15-93			18	19	
Z5		10-19-93			14	15	
Z6		10-21-93			12	13	
Z7		10-21-93			12	13	
Z8		10-22-93			11	12	
Z9		10-22-93			11	12	
B09901		10-25-93			8	9	
B09903		10-25-93			8	9	

RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Z1-TMA-636 (923-E418 Filename B098Z1.RAD)

9413225.2235

MEMORANDUM

MAR 1994 RECEIVED TDO

TO: 200-UP-2 Project QA Record

March 25, 1994

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B098Z1-TMA-636 (923-E418, Filename B098Z1.RAD)

INTRODUCTION

This memo presents the results of data validation on data package B098Z1-TMA-636 prepared by the Thermo Analytical (TMA) 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
B098Z1	10/11/93	SOIL	See Note 1
B098Z2	10/12/93	SOIL	
B098Z3	10/14/93	SOIL	
B098Z4	10/15/93	SOIL	
B098Z5	10/19/93	SOIL	
B098Z6	10/21/93	SOIL	
B098Z7	10/21/93	SOIL	
B098Z8	10/22/93	SOIL	
B098Z9	10/22/93	SOIL	
B09901	10/25/93	SOIL	
B09903	10/25/93	SOIL	

Note 1. All samples were analyzed for gross alpha, gross beta, technetium-99, isotopic uranium, and total uranium.

RECEIVED MAR 23 1994 VALIDATION DOCUMENT SDLA

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

Precision. Goals for precision were met.

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

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

Detection Limits. Detection limit goals were met with the exception of the following:

SAMPLE ID	ANALYTE	MDA	RDL
B098Z4	TECHNETIUM-99	0.7 pCi/g	0.5 pCi/g

Completeness. The data package was complete for all requested analyses. A total of eleven samples were validated in this data package with a total of 77 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.

Chemical Yield

- Technetium-99 chemical yield for sample B098Z4 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

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.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9117225.2238

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.

9413225.2239

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

94/3225.2240

DATA QUALIFICATION SUMMARY

B098Z1-TMA-636

SDG:	VALIDATOR: [illegible]	DATE: 03/22/94	PAGE 1 OF 1
COMMENTS: Radiochemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tc-99	J	B098Z4	Chemical Recovery <30% but >10%.

9413225.2241

006

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

94/322F.2242

Validated Data Summary, Data Package: B09821-TMA-636

	Samp#	B09821		B09822		B09823		B09824		B09825		B09826	
	Date	10-11-93		10-12-93		10-14-93		10-15-93		10-19-93		10-21-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	5.000	U	8.200		4.000	U	7.200		9.300		5.000	U
GROSS BETA	pCi/g	460.000		170.000		23.000		30.000		20.000		23.000	
TECHNETIUM-99	pCi/g	0.300	U	0.940		0.600		0.870	J	0.580		0.470	
URANIUM-233/234	pCi/g	0.880		2.300		0.730		0.580		0.380		0.450	
URANIUM-235	pCi/g	0.140		0.240		0.100	U	0.100	U	0.100	U	0.100	U
URANIUM-238	pCi/g	1.000		2.200		0.680		0.620		0.490		0.500	
TOTAL URANIUM	UG/G	2.900		5.100		2.100		1.500		NR		1.500	

Verified
3/25/94

9413225.2244

Validated Data Summary, Data Package: B09BZ1-IMA-636

	Samp#	B09BZ7		B09BZ8		B09BZ9		B09901		B09903	
	Date	10-21-93		10-22-93		10-22-93		10-25-93		10-25-93	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	µCi/g	4.500		9.400		6.100		6.800		11.000	
GROSS BETA	pCi/g	20.000		22.000		24.000		17.000		15.000	
TECHNETIUM-99	µCi/g	0.230		0.230		0.300	U	0.270		0.200	U
URANIUM-233/234	µCi/g	0.560		0.560		0.300		0.780		0.560	
URANIUM-235	µCi/g	0.100	U	0.100	U	0.100	U	0.200	U	0.200	U
URANIUM-238	µCi/g	0.630		0.760		0.640		0.840		0.610	
TOTAL URANIUM	UG/G	1.500		1.700		1.600		1.900		1.900	

Verified
[illegible] 3/25/94

N310164-01

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z1

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-01	Client sample id	B098Z1
Dept sample id	7285-001	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/11/93
% moisture	2.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	-2.5	4.7	5	10	U	80A
Gross Beta	Beta	460	14	5	10		80B
Technetium 99	14133-76-7	0.14	0.10	0.3	0.5	U	TC
Uranium 233/234		0.88	0.23	0.1	0.3		U
Uranium 235	15117-96-1	0.14	0.10	0.1	0.3		U
Uranium 238		1.0	0.23	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	2.9	0.52	0.03	0.1		U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-01	80A/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	80B/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	TC	7285-001		2.00 g	12/08/93	12/13/93	DPK
N310164-01	U	7285-001		1.00 g	12/06/93	12/08/93	DPK
N310164-01	U_T	7285-001		0.250 g	12/15/93	12/21/93	DPK

Verified

2/23/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/29/93

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 12

N310164-02

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z2

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-02	Client sample id	B098Z2
Dept sample id	7285-002	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/12/93
% moisture	4.7	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	8.2	4.8	4	10	~~J~~	80A
Gross Beta	Beta	170	9.1	5	10		80B
Technetium 99	14133-76-7	0.94	0.15	0.2	0.5		TC
Uranium 233/234		2.3	0.45	0.2	0.3		U
Uranium 235	15117-96-1	0.24	0.14	0.1	0.3	~~J~~	U
Uranium 238		2.2	0.44	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	5.1	0.93	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-02	80A/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	80B/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	TC	7285-002		2.00 g	12/14/93	12/15/93	DPK
N310164-02	U	7285-002		1.00 g	12/06/93	12/08/93	DPK
N310164-02	U_T	7285-002		0.250 g	12/15/93	12/21/93	DPK

Verified

2/23/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-03

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z3

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-03	Client sample id	B098Z3
Dept sample id	7285-003	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/14/93
% moisture	3.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	2.1	3.1	4	10	U	80A
Gross Beta	Beta	23	4.7	6	10		80B
Technetium 99	14133-76-7	0.60	0.17	0.4	0.5		TC
Uranium 233/234		0.73	0.19	0.08	0.3		U
Uranium 235	15117-96-1	0.053	0.054	0.1	0.3	U	U
Uranium 238		0.68	0.19	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	2.1	0.37	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-03	80A/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	80B/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	TC	7285-003		2.00 g	12/14/93	12/15/93	DPK
N310164-03	U	7285-003		1.00 g	12/06/93	12/08/93	DPK
N310164-03	U_T	7285-003		0.250 g	12/15/93	12/21/93	DPK

Verified

2/23/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-04

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z4

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-04	Client sample id	B098Z4
Dept sample id	7285-004	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/15/93
% moisture	2.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	7.2	4.1	4	10	J	80A
Gross Beta	Beta	30	4.7	5	10		80B
Technetium 99	14133-76-7	0.87	0.31	0.7	0.5		TC
Uranium 233/234		0.58	0.17	0.1	0.3		U
Uranium 235	15117-96-1	0.037	0.050	0.1	0.3	U	U
Uranium 238		0.62	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-04	80A/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	80B/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	TC	7285-004		2.00 g	12/14/93	12/15/93	DPK
N310164-04	U	7285-004		1.00 g	12/06/93	12/08/93	DPK
N310164-04	U_T	7285-004		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-05

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z5

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-05	Client sample id	B098Z5
Dept sample id	7285-005	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/19/93
% moisture	6.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	9.3	4.9	5	10	~~J~~	80A
Gross Beta	Beta	20	4.2	5	10		80B
Technetium 99	14133-76-7	0.58	0.16	0.3	0.5		TC
Uranium 233/234		0.38	0.15	0.1	0.3		U
Uranium 235	15117-96-1	0.025	0.050	0.1	0.3	U	U
Uranium 238		0.49	0.15	0.08	0.3		U

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-05	80A/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	80B/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	TC	7285-005		2.00 g	12/14/93	12/15/93	DPK
N310164-05	U	7285-005		1.00 g	12/08/93	12/13/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-06

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z6

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-06	Client sample id	B098Z6
Dept sample id	7285-006	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/21/93
% moisture	5.2	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	2.2	3.5	5	10	U	80A
Gross Beta	Beta	23	4.5	5	10		80B
Technetium 99	14133-76-7	0.47	0.10	0.2	0.5	~~J~~	TC
Uranium 233/234		0.45	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0.081	0.081	0.1	0.3	U	U
Uranium 238		0.50	0.16	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	~~*~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-06	80A/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	80B/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	TC	7285-006		2.00 g	12/14/93	12/15/93	DPK
N310164-06	U	7285-006		1.00 g	12/08/93	12/13/93	DPK
N310164-06	U_T	7285-006		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

2/23/94

N310164-07

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z7

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-07	Client sample id	B098Z7
Dept sample id	7285-007	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/21/93
% moisture	3.8	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	4.5	3.7	4	10	~~J~~	80A
Gross Beta	Beta	20	4.3	5	10		80B
Technetium 99	14133-76-7	0.23	0.065	0.1	0.5	~~J~~	TC
Uranium 233/234		0.56	0.16	0.08	0.3		U
Uranium 235	15117-96-1	0	0.026	0.1	0.3	U	U
Uranium 238		0.63	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.28	0.03	0.1	~~*~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-07	80A/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	80B/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	TC	7285-007		2.00 g	12/16/93	12/16/93	DPK
N310164-07	U	7285-007		1.00 g	12/08/93	12/18/93	DPK
N310164-07	U_T	7285-007		0.250 g	12/15/93	12/21/93	DPK

Yes Sled

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

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N310164-08

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z8

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-08	Client sample id	B098Z8
Dept sample id	7285-008	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/22/93
% moisture	4.8	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	9.4	4.4	4	10	~~J~~	80A
Gross Beta	Beta	22	4.4	5	10		80B
Technetium 99	14133-76-7	0.23	0.089	0.2	0.5	~~J~~	TC
Uranium 233/234		0.56	0.18	0.1	0.3		U
Uranium 235	15117-96-1	0.038	0.051	0.1	0.3	U	U
Uranium 238		0.76	0.20	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.7	0.31	0.03	0.1	~~*~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-08	80A/80	7285-008		0.100 g	12/08/93	12/09/93	DPK
N310164-08	80B/80	7285-008		0.100 g	12/08/93	12/09/93	DPK
N310164-08	TC	7285-008		2.00 g	12/15/93	12/16/93	DPK
N310164-08	U	7285-008		1.00 g	12/08/93	12/18/93	DPK
N310164-08	U_T	7285-008		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

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N310164-09

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z9

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-09	Client sample id	B098Z9
Dept sample id	7285-009	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/22/93
% moisture	4.8	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	6.1	4.1	4	10	~~J~~	80A
Gross Beta	Beta	24	4.5	5	10		80B
Technetium 99	14133-76-7	0.26	0.11	0.3	0.5	U	TC
Uranium 233/234		0.30	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0.037	0.037	0.1	0.3	U	U
Uranium 238		0.64	0.20	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.30	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-09	80A/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	80B/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	TC	7285-009		2.00 g	12/15/93	12/20/93	DPK
N310164-09	U	7285-009		1.00 g	12/10/93	12/13/93	DPK
N310164-09	U_T	7285-009		0.250 g	12/15/93	12/21/93	DPK

Unsigned

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

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-018

N310164-10

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B09901

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-10	Client sample id	B09901
Dept sample id	7285-010	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/25/93
% moisture	9.5	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	6.8	3.9	4	10	~~J~~	80A
Gross Beta	Beta	17	4.4	6	10		80B
Technetium 99	14133-76-7	0.27	0.062	0.1	0.5	~~J~~	TC
Uranium 233/234		0.78	0.27	0.2	0.3		U
Uranium 235	15117-96-1	0.076	0.10	0.2	0.3	U	U
Uranium 238		0.34	0.28	0.2	0.3		U
Total Uranium (ug/g)	7440-61-1	1.9	0.34	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-10	80A/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	80B/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	TC	7285-010		2.00 g	12/13/93	12/16/93	DPK
N310164-10	U	7285-010		1.00 g	12/13/93	12/15/93	DPK
N310164-10	U_T	7285-010		0.250 g	12/15/93	12/21/93	DPK

Verified

7/23/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-11

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B09903

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-11	Client sample id	B09903
Dept sample id	7285-011	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/25/93
% moisture	7.5	Chain of custody id	EFL-1091

9417225.2255

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	11	4.7	4	10		80A
Gross Beta	Beta	15	4.2	5	10		80B
Technetium 99	14133-76-7	0.18	0.083	0.2	0.5	U	TC
Uranium 233/234		0.56	0.22	0.1	0.3		U
Uranium 235	15117-96-1	0.021	0.043	0.2	0.3	U	U
Uranium 238		0.61	0.22	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.9	0.34	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-11	80A/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	80B/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	TC	7285-011		2.00 g	12/13/93	12/20/93	DPK
N310164-11	U	7285-011		1.00 g	12/13/93	12/15/93	DPK
N310164-11	U_T	7285-011		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9413225.2256

SDG: 7285
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7285

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

CASE NARRATIVE

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7285 is comprised of the samples listed on the Chain-of-Custody documents below. This sample group was processed under the Westinghouse Hanford Company Statement of Work P.O. MBH-SVV-069262.

1.1 Chains-of-Custody

This report includes data for the eleven soil samples from location 200-UP-2 delivered under Field Log Book No. EFL-1091. Chain-of-Custody numbers were not provided.

1.2 Sample Volume

One thousand mL plastic bottles containing the samples were received for the analyses.

1.3 Missing Samples

All samples listed on the Field Log Book documents were received.

1.4 Holding Times

The samples were collected on October 11 through October 25, 1993 and sample processing was initiated within 180 days of collection.

2.0 QUALITY CONTROL

The internal quality control consisted of one sample each of a laboratory control sample, a blank, and a replicate. All original analyses were performed with QC samples 7285-12 through 7285-14.

The QC samples were prepared by the Quality Control Department. Copies of the QC notebook pages are included in this data package.

2.1 Laboratory Control Samples

The LCS recoveries for all nuclides were acceptable. The MDA's of the results for all analyses met the RDL's.

2.2 Reagent Blanks

The results were satisfactory for all analyses. The MDA's of the results for all analyses met the RDL's.

SDG: 7285
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7285

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

2.0 QUALITY CONTROL (cont'd)

2.3 Duplicates

Results were satisfactory for all duplicate analyses.

3.0 ANALYSIS NOTES

3.1 Gross Alpha Analyses

The average MDA for gross alpha was (4 ± 1) pCi/g. Gross alpha activity above the RDL was found in sample BO9903.

3.2 Gross Beta Analyses

The average MDA for gross beta was (5 ± 0.9) pCi/g. Gross beta activity above the RDL was found in all of the samples.

3.3 Technetium-99 Analyses

The average yield for fourteen analyses was (50 ± 29)%. The lowest yield was 19% and the highest was 75%. The average MDA was (0.3 ± 0.3) pCi/g. Technetium-99 activity above the RDL was found in samples BO98Z2, BO98Z3, BO98Z4, and BO98Z5. The MDA of the result for sample BO98Z4 was higher than the RDL because of a low chemical yield.

3.4 Total Uranium Analyses

The average MDA was (0.03 ± 0.01) μg/g. Uranium activity ranging from (1.5 to 5.1) μg/g was found in the samples.

3.5 Isotopic Uranium Analyses

The average yield for fourteen analyses was (66 ± 16)%. The lowest yield was 54% and the highest was 77%. The average MDA was (0.1 ± 0.1) pCi/g. Uranium-233/234 and uranium-238 activity above the RDL was found in all of the samples. Samples BO9901 and BO9903 were counted for less than the nominal count time of 150 minutes. MDA's met RDL's despite the slightly shortened count times.

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 10-11-93

Ice Chest No.: KENT — Field Logbook No.: EFL-1091

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B098Z1
   1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
   1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
   ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

3) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) REK 10-11-93
   1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 0920 Loren E. Rogers 10-28-93	Received by:	Date/Time: 10-29-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9112225.2259

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

~~C-57~~

-024

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-12-93

Ice Chest No.: KENT

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09822

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)

1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~

1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3) 10-12-93

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)

1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
10-28-93 Joann E. Rogers 0920	[signature]	10-28-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9472259.2260

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

0-57

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 10-14-93

Ice Chest No.: SML-349 — Field Logbook No.: EFL-1091

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09823
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3) LER 10-14-93
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Relinquished by:	Received by:	Date/Time:
10-28-93 Leann E. Rogers 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~G-50~~

-026

Westinghouse Hanford Company	10-15-93 CHAIN OF CUSTODY

Custody Form Initiator ~~L E ROGERS~~ W.S. Thompson

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-15-93 TIME: 1051

Ice Chest No. SMB-349

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) 609824
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

[] Field Transfer of Custody

Chain of Possession		(Sign and Print Names)
Relinquished by: W.S. Thompson 1130 10-15-93	Received by: Roy T Steele	Date/Time: 10-15-93 1130
Relinquished by: 10-28-93 0820 Roy T Steele	Received by: 10-28-93 0820 Lorene E. Rogers	Date/Time: 10-28-93 0820
Relinquished by: 10-28-93 Lorene E. Rogers 0930	Received by: TMA/NORCAL	Date/Time: 10-29-93 12:35
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

~~0-61~~

027

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-19-93

Ice Chest No.: SML-349

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: WESTON

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09BZ5

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

2)

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

3) JER 10-19-93

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

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

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/HORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9413275.2263

~~0 60~~

-028

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-21-93

Ice Chest No.: SML-413

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) [redacted]
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B09BZ9
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~
- ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 10-21-93
- ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 10-22-93

Ice Chest No.: SML-413 — Field Logbook No.: EFL-1091

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B098Z8
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B098Z9
- 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
- 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ 10-22-93
- ~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/HORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9412275.2265

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-25-93

Ice Chest No.: SML-415

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09901

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~B09902~~ B09903

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/NORCAL	10-29-93 12:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

0-69

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9413225.2267

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09871-TMA-636
VALIDATOR: [illegible]	LAB: TMA	DATE: 02/22/94
CASE:		SDG: B09871-TMA-636

ANALYSES PERFORMED

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

SAMPLES/MATRIX Soils

B09871	B09876	B09903
B09872	B09877	
B09873	B09878	
B09874	B09879	
B09875	B09901	

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: The initial calibration for the gas proportional counters used for gross alpha and gross beta analysis was performed more than a year prior to sample analysis. However, since the QCV criteria was met, no qualification is required.

9413225.2268

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: The control limits for the LRG detectors were submitted by the lab under separate cover from the data package. No qualifications were required.

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:

9413225.2269

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

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

Comments:

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: All tracer and chemical recoveries are acceptable with the exception of the chemical recovery for sample R09874 at 19% recovery. The Tc-99 result has been qualified as estimated (J).

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: The sample locations are not currently available. However, field duplicate and field split samples will be evaluated in the final summary report.

10. Holding Times

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

Comments:

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: The MDA does not meet the RDL for the following samples:

Parameter	Sample ID	MDA	RDL	Units
Tc-99	B09874	0.7	0.5	pCi/g

TMA NORCAL

REPORTING GROUP 7285

WORK SUMMARY

SDG 7285
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	MATRIX / SAS NO	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	# Days @ 3/25/94 REVIEWED BY	METHOD
B098Z1		N310164-01	7285-001	80A/80		12/08/93	58	Gross Alpha in Soil
200-UP-2	SOLID	10/11/93	7285-001	80B/80		12/08/93	58	Gross Beta in Soil
EFL-1091		10/29/93	7285-001	TC		12/08/93	58	Technetium 99 in Soil
			7285-001	U		12/06/93	56	Uranium, Isotopic in Soil
			7285-001	U_T		12/15/93	65	Uranium, Total in Soil
B098Z2		N310164-02	7285-002	80A/80		12/08/93	57	Gross Alpha in Soil
200-UP-2	SOLID	10/12/93	7285-002	80B/80		12/08/93	57	Gross Beta in Soil
EFL-1091		10/29/93	7285-002	TC		12/14/93	63	Technetium 99 in Soil
			7285-002	U		12/06/93	55	Uranium, Isotopic in Soil
			7285-002	U_T		12/15/93	64	Uranium, Total in Soil
B098Z3		N310164-03	7285-003	80A/80		12/08/93	55	Gross Alpha in Soil
200-UP-2	SOLID	10/14/93	7285-003	80B/80		12/08/93	55	Gross Beta in Soil
EFL-1091		10/29/93	7285-003	TC		12/14/93	61	Technetium 99 in Soil
			7285-003	U		12/06/93	53	Uranium, Isotopic in Soil
			7285-003	U_T		12/15/93	62	Uranium, Total in Soil
B098Z4		N310164-04	7285-004	80A/80		12/09/93	55	Gross Alpha in Soil
200-UP-2	SOLID	10/15/93	7285-004	80B/80		12/09/93	55	Gross Beta in Soil
EFL-1091		10/29/93	7285-004	TC		12/14/93	60	Technetium 99 in Soil
			7285-004	U		12/06/93	52	Uranium, Isotopic in Soil
			7285-004	U_T		12/15/93	61	Uranium, Total in Soil
B098Z5		N310164-05	7285-005	80A/80		12/08/93	50	Gross Alpha in Soil
200-UP-2	SOLID	10/19/93	7285-005	80B/80		12/08/93	50	Gross Beta in Soil
EFL-1091		10/29/93	7285-005	TC		12/14/93	56	Technetium 99 in Soil
			7285-005	U		12/08/93	50	Uranium, Isotopic in Soil
B098Z6		N310164-06	7285-006	80A/80		12/08/93	48	Gross Alpha in Soil
200-UP-2	SOLID	10/21/93	7285-006	80B/80		12/08/93	48	Gross Beta in Soil
EFL-1091		10/29/93	7285-006	TC		12/14/93	54	Technetium 99 in Soil
			7285-006	U		12/08/93	48	Uranium, Isotopic in Soil
			7285-006	U_T		12/15/93	55	Uranium, Total in Soil

3/25/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.27
Report date 12/29/93

TMA NORCAL
REPORTING GROUP 7285

SDG 7285
Contact Dinkar Kharkar

WORK SUMMARY, cont.

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID LOCATION CUSTODY	MATRIX SAS NO	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED BY (* Dens 3/25/94)	METHOD
809827		N310164-07	7285-007	80A/80		12/09/93	49	Gross Alpha in Soil
200-UP-2	SOLID	10/21/93	7285-007	80B/80		12/09/93	49	Gross Beta in Soil
EFL-1091		10/29/93	7285-007	TC		12/16/93	56	Technetium 99 in Soil
			7285-007	U		12/08/93	48	Uranium, Isotopic in Soil
			7285-007	U_T		12/15/93	55	Uranium, Total in Soil
809828		N310164-08	7285-008	80A/80		12/08/93	47	Gross Alpha in Soil
200-UP-2	SOLID	10/22/93	7285-008	80B/80		12/08/93	47	Gross Beta in Soil
EFL-1091		10/29/93	7285-008	TC		12/15/93	54	Technetium 99 in Soil
			7285-008	U		12/08/93	47	Uranium, Isotopic in Soil
			7285-008	U_T		12/15/93	54	Uranium, Total in Soil
809829		N310164-09	7285-009	80A/80		12/08/93	47	Gross Alpha in Soil
200-UP-2	SOLID	10/22/93	7285-009	80B/80		12/08/93	47	Gross Beta in Soil
EFL-1091		10/29/93	7285-009	TC		12/15/93	54	Technetium 99 in Soil
			7285-009	U		12/10/93	49	Uranium, Isotopic in Soil
			7285-009	U_T		12/15/93	54	Uranium, Total in Soil
809901		N310164-10	7285-010	80A/80		12/08/93	44	Gross Alpha in Soil
200-UP-2	SOLID	10/25/93	7285-010	80B/80		12/08/93	44	Gross Beta in Soil
EFL-1091		10/29/93	7285-010	TC		12/13/93	49	Technetium 99 in Soil
			7285-010	U		12/13/93	49	Uranium, Isotopic in Soil
			7285-010	U_T		12/15/93	51	Uranium, Total in Soil
809903		N310164-11	7285-011	80A/80		12/09/93	45	Gross Alpha in Soil
200-UP-2	SOLID	10/25/93	7285-011	80B/80		12/09/93	45	Gross Beta in Soil
EFL-1091		10/29/93	7285-011	TC		12/13/93	49	Technetium 99 in Soil
			7285-011	U		12/13/93	49	Uranium, Isotopic in Soil
			7285-011	U_T		12/15/93	51	Uranium, Total in Soil
Reagent Blank		N310164-13	7285-013	80A/80		12/09/93		Gross Alpha in Soil
	SOLID		7285-013	80B/80		12/09/93		Gross Beta in Soil
			7285-013	TC		12/16/93		Technetium 99 in Soil
			7285-013	U		12/13/93		Uranium, Isotopic in Soil
			7285-013	U_T		12/15/93		Uranium, Total in Soil

3/25/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.27
Report date 12/29/93

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-638

B098Z1-TMA-638
Gross Alpha/Beta

Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B098Z01	B098Z03	LCS	BLANK	B098Z2 DUP
Aliquot:	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Detector:	104	109	110	101	101	102	104	104	109	110	102	102	110	104
Count time:	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Alpha cpm:	0.27	0.38	0.14	0.34	0.38	0.18	0.2	0.37	0.23	0.28	0.37	6.08	0.04	0.38
Alpha, Bkgd:	0.072	0.057	0.064	0.092	0.091	0.086	0.064	0.072	0.057	0.064	0.062	0.068	0.051	0.072
Alpha, Xtalk:	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff:	0.113	0.124	0.132	0.143	0.125	0.126	0.125	0.137	0.117	0.135	0.125	0.108	0.106	0.11
Alpha Result Calc.:	-2.28	8.29	2.15	7.27	9.28	2.18	4.49	9.39	6.16	6.88	10.80	248.80	-0.48	9.16
Alpha Result Rptd.:	-2.50	8.21	2.13	7.24	9.30	2.17	4.47	9.40	6.11	6.83	10.70	24.80	-0.05	9.11
Alpha MDA Calc.:	4.98	4.04	4.02	4.45	5.07	4.89	4.25	4.11	4.28	3.93	4.18	5.81	4.47	5.12
Alpha MDA Rptd.:	4.98	4.06	4.05	4.44	5.09	4.88	4.24	4.10	4.27	3.93	4.19	0.58	0.45	5.10
Beta cpm:	43.53	16.89	3.44	3.86	2.92	3.31	2.94	3.13	3.25	2.94	2.59	23.5	1.29	15.11
Bkgd:	1.009	1.032	1.257	0.953	0.947	1.123	1.01	1.009	1.032	1.257	1.122	1.123	1.261	1.009
Xtalk:	0.282	0.277	0.271	0.264	0.276	0.275	0.276	0.268	0.28	0.269	0.276	0.291	0.291	0.283
Eff:	0.416	0.418	0.419	0.421	0.418	0.418	0.418	0.42	0.417	0.42	0.418	0.413	0.414	0.415
Beta Result Calc.:	459.82	169.93	23.25	30.40	20.46	23.35	20.39	21.89	23.44	17.43	14.90	225.07	0.35	152.11
Beta Result Rptd:	461.00	170.00	23.30	30.40	20.50	23.40	20.40	21.90	23.50	17.50	14.90	22.50	0.04	152.00
Beta MDA Calc:	5.07	5.10	5.62	4.87	4.89	5.32	5.05	5.02	5.11	5.60	5.32	5.39	5.69	5.08
Beta MDA rptd:	5.08	5.10	5.61	4.87	4.89	5.32	5.05	5.02	5.12	5.60	5.32	0.54	0.57	5.08

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Technetium 99

Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09803	LCS	BLANK	B098Z2 DUP
Detector:	LBG 14	LBG 9	LBG 10	LBG 11	LBG 12	LBG 13	LBG 11	LBG 11	LBG 12	LBG 11	LBG 12	LBG 13	LBG 9	LBG 12
Net, cpm:	0.17	1	0.42	0.31	0.42	0.55	0.25	0.33	0.27	0.28	0.14	13.49	0.08	1.27
Days:	58.971	57.971	55.971	57.547	53.547	51.547	51.547	50.547	54.619	49.856	49.856	0	0	65.619
Lambda:	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09
Decay:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Yield:	0.6187	0.5607	0.3747	0.1887	0.3859	0.6138	0.574	0.7517	0.5674	0.5524	0.3915	0.3167	0.5386	0.5237
Aliquot:	2	2	2	2	2	2	2	2	2	2	2	2	2	2
P-Factor:	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Count, time:	103.8	195.7	195.7	195.7	195.7	195.7	504	136.4	136.4	761.6	761.6	761.6	183.8	504
Bkg., cpm:	0.49	0.54	0.55	0.5	0.55	0.45	0.5	0.5	0.55	0.5	0.55	0.45	0.54	0.55
Result, calc.:	0.14	0.94	0.59	0.87	0.57	0.47	0.23	0.23	0.25	0.27	0.19	22.45	0.08	1.28
Result, rptd.:	0.14	0.94	0.60	0.87	0.58	0.47	0.23	0.23	0.26	0.27	0.18	22.45	0.08	1.28
MDA, calc.:	0.27	0.23	0.35	0.66	0.34	0.19	0.13	0.20	0.27	0.11	0.17	0.19	0.25	0.15
MDA, rptd.:	0.30	0.25	0.38	0.70	0.35	0.21	0.14	0.21	0.29	0.12	0.17	0.20	0.27	0.16

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Uranium 233/4/5/8

Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09903	LCS	BLANK	B098Z2 DUP
Detector:	SS-19	SS-20	SS-21	SS-24	SS-19	SS-20	SS-21	SS-26	SS-26	SS-20	SS-21	SS-23	SS-26	SS-20
Sample count time:	214.2	214.2	214.2	214.2	231.08	231.08	231.08	231.08	165.42	149.42	149.42	356.6	149.08	141.43
GMT count:	340.953	340.953	340.953	340.953	343.013	343.013	343.013	343.013	344.683	347.997	347.997	355.82	347.997	351
Zero time:	284.292	285.292	287.292	288.292	292.292	294.292	294.292	295.292	295.292	298.292	298.292	355.82	347.997	284.292
Corr. tracer dpm:	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49
Bkgd count time:	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2383.07	2383.07	1132.27	2383.07	2383.07
Net tracer counts:	445	330	429	457	457	423	435	451	310	225	269	917	242	219
Detector eff.:	0.261	0.2675	0.2479	0.3185	0.2647	0.2675	0.2476	0.2803	0.264	0.2671	0.2463	0.3121	0.2833	0.2654
Yield:	0.7599	0.5499	0.7715	0.6396	0.7135	0.6534	0.7281	0.6646	0.6302	0.5385	0.6981	0.7259	0.5472	0.5573
U-238, gross counts:	98	157	62	61	48	47	56	74	42	40	35	1120	4	128
U-238, bkgd counts:	2	2	0	1	1	2	0	1	0	0	0	62	0	1
U-238, Lambda:	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	12	15	5	4	3	7	1	3	2	3	1	614	0	10
U-235, bkgd counts:	1	1	1	1	1	1	1	0	0	0	0	2	0	0
U-235, Lambda:	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12
U-235, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts:	89	169	68	60	42	44	54	58	22	38	33	1030	7	112
U-233/4, bkgd counts:	5	5	2	4	5	4	2	4	2	1	1	72	2	2
U-233/4, Lambda:	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08
U-233/4, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Aliquot:	1	1	1	1	1	1	1	1	1	1	1	1	1	1
U-238, result calc.:	1.02	2.22	0.68	0.62	0.49	0.50	0.63	0.76	0.64	0.84	0.61	6.44	0.08	2.73
U-238, result rptd:	1.02	2.22	0.68	0.62	0.49	0.50	0.63	0.76	0.64	0.84	0.61	6.44	0.08	2.74
U-238 MDA calc.:	0.08	0.11	0.08	0.08	0.08	0.09	0.08	0.08	0.12	0.16	0.13	0.19	0.15	0.17
U-238, MDA rptd.:	0.08	0.11	0.08	0.08	0.08	0.09	0.08	0.08	0.12	0.16	0.13	0.19	0.15	0.17
U-235, result calc.:	0.14	0.24	0.05	0.04	0.02	0.08	0.00	0.04	0.04	0.08	0.02	3.81	0.00	0.26
U-235, result rptd.:	0.14	0.24	0.05	0.04	0.02	0.08	0.00	0.04	0.04	0.08	0.02	3.81	0.00	0.26
U-235, MDA calc.:	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.14	0.19	0.16	0.05	0.18	0.20
U-235, MDA rptd.:	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.14	0.19	0.16	0.05	0.18	0.20
U-233/4, result calc.:	0.89	2.34	0.73	0.58	0.38	0.45	0.56	0.56	0.30	0.78	0.56	4.93	0.10	2.37
U-233/4, result rptd.:	0.88	0.23	0.73	0.58	0.38	0.45	0.56	0.56	0.30	0.78	0.56	4.93	0.10	2.37
U-233/4, MDA calc.:	0.11	0.15	0.08	0.10	0.11	0.10	0.08	0.10	0.12	0.16	0.13	0.20	0.15	0.17
U-233/4, MDA rptd.:	0.14	0.18	0.08	0.11	0.13	0.12	0.08	0.12	0.15	0.16	0.13	0.22	0.19	0.21

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Total Uranium

Standard	Intensity			ug/L	ug/L	Amount	Prep.		Calc	Rptd
0.049	534	Sample ID	Intens.	Calc.	Rptd	of Smpl	Volume	Dilution	Result	Rslt
0.156	1346	B098Z1	28475	3.261	3.58478	0.25	0.02	10	2.87	2.90
0.521	4460	B098Z2	50969	5.837	6.33278	0.25	0.02	10	5.07	5.09
0.976	8440	B098Z3	20939	2.398	2.57217	0.25	0.02	10	2.06	2.06
2.603	21956	B098Z4	15355	1.758	1.86486	0.25	0.02	10	1.49	1.49
4.881	41542	B098Z6	15286	1.760	1.8764	0.25	0.02	10	1.50	1.50
16.27	129728	B098Z7	16125	1.847	1.91936	0.25	0.02	10	1.54	1.54
		B098Z8	17565	2.011	2.14731	0.25	0.02	10	1.72	1.72
Slope:	1.1E-04	B098Z9	17066	1.954	2.05607	0.25	0.02	10	1.64	1.65
		B09901	19289	2.209	2.35082	0.25	0.02	10	1.88	1.88
		B09903	18409	2.108	2.32018	0.25	0.02	10	1.86	1.86
		LCS	33587	3.846	3.78175	0.25	0.02	10	3.03	3.02
		BLANK	-584	-0.067	0.036	0.25	0.02	1	0.003	0.003
		B098Z2 DUP	51139	5.856	6.57246	0.25	0.02	10	5.26	5.26

RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Z1-TMA-636 (923-E418, Filename B098Z1.RAD)

9453549D

MEMORANDUM

TO: 200-UP-2 Project QA Record March 25, 1994

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B098Z1-TMA-636 (923-E418, Filename B098Z1.RAD)

INTRODUCTION

This memo presents the results of data validation on data package B098Z1-TMA-636 prepared by the Thermo Analytical (TMA) 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
B098Z1	10/11/93	SOIL	SEE NOTE 1
B098Z2	10/12/93	SOIL	
B098Z3	10/14/93	SOIL	
B098Z4	10/15/93	SOIL	
B098Z5	10/19/93	SOIL	
B098Z6	10/21/93	SOIL	
B098Z7	10/21/93	SOIL	
B098Z8	10/22/93	SOIL	
B098Z9	10/22/93	SOIL	
B09901	10/25/93	SOIL	
B09903	10/25/93	SOIL	

Note 1. All samples were analyzed for gross alpha, gross beta, technetium-99, isotopic uranium, and total uranium.

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

Precision. Goals for precision were met.

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

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

Detection Limits. Detection limit goals were met with the exception of the following:

SAMPLE ID	ANALYTE	MDA	RDL
B098Z4	TECHNETIUM-99	0.7 pCi/g	0.5 pCi/g

Completeness. The data package was complete for all requested analyses. A total of eleven samples were validated in this data package with a total of 77 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.

Chemical Yield

- Technetium-99 chemical yield for sample B098Z4 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

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.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9413225.2281

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

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

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

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

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

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

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9411325.2293

DATA QUALIFICATION SUMMARY

B098Z1-TMA-636

SDG:	VALIDATOR:	DATE: 03/22/94	PAGE 1 OF 1
COMMENTS: Radiochemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tc-99	J	B098Z4	Chemical Recovery <30% but >10%.

9413275.2281

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9417225.2205

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Validated Data Summary, Data Package: B098Z1-TMA-636

	Samp#	B098Z1		B098Z2		B098Z3		B098Z4		B098Z5		B098Z6	
	Date	10-11-93		10-12-93		10-14-93		10-15-93		10-19-93		10-21-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	5.000	U	8.200		4.000	U	7.200		9.300		5.000	U
GROSS BETA	pCi/g	460.000		170.000		23.000		30.000		20.000		23.000	
TECHNETIUM-99	pCi/g	0.300	U	0.940		0.600		0.870	J	0.580		0.470	
URANIUM-233/234	pCi/g	0.880		2.300		0.730		0.580		0.380		0.450	
URANIUM-235	pCi/g	0.140		0.240		0.100	U	0.100	U	0.100	U	0.100	U
URANIUM-238	pCi/g	1.000		2.200		0.680		0.620		0.490		0.500	
TOTAL URANIUM	UG/G	2.900		5.100		2.100		1.500		NR		1.500	

Verified

3/25/94

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Validated Data Summary, Data Package: B09821-TMA-636

	Samp#	B09827		B09828		B09829		B09901		B09903	
	Date	10-21-93		10-22-93		10-22-93		10-25-93		10-25-93	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
GROSS ALPHA	pCi/g	4.500		9.400		6.100		6.800		11.000	
GROSS BETA	pCi/g	20.000		22.000		24.000		17.000		15.000	
TECHNETIUM-99	pCi/g	0.230		0.230		0.300	U	0.270		0.200	U
URANIUM-233/234	pCi/g	0.560		0.560		0.300		0.780		0.560	
URANIUM-235	pCi/g	0.100	U	0.100	U	0.100	U	0.200	U	0.200	U
URANIUM-238	pCi/g	0.630		0.760		0.640		0.840		0.610	
TOTAL URANIUM	UG/G	1.500		1.700		1.600		1.900		1.900	

Verified
[signature] 3/25/94

N310164-01

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z1

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-01	Client sample id	B098Z1
Dept sample id	7285-001	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/11/93
% moisture	2.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	Alpha	-2.5	4.7	5	10	U	80A
Gross Beta	Beta	460	14	5	10		80B
Technetium 99	14133-76-7	0.14	0.10	0.3	0.5	U	TC
Uranium 233/234		0.88	0.23	0.1	0.3		U
Uranium 235	15117-96-1	0.14	0.10	0.1	0.3		U
Uranium 238		1.0	0.23	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	2.9	0.52	0.03	0.1		U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-01	80A/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	80B/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	TC	7285-001		2.00 g	12/08/93	12/13/93	DPK
N310164-01	U	7285-001		1.00 g	12/06/93	12/08/93	DPK
N310164-01	U_T	7285-001		0.250 g	12/15/93	12/21/93	DPK

verified

2/22/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 12

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N310164-02

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z2

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-02	Client sample id	B098Z2
Dept sample id	7285-002	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/12/93
% moisture	4.7	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	8.2	4.8	4	10	J	80A
Gross Beta	Beta	170	9.1	5	10		80B
Technetium 99	14133-76-7	0.94	0.15	0.2	0.5		TC
Uranium 233/234		2.3	0.45	0.2	0.3		U
Uranium 235	15117-96-1	0.24	0.14	0.1	0.3	J	U
Uranium 238		2.2	0.44	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	5.1	0.93	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-02	80A/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	80B/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	TC	7285-002		2.00 g	12/14/93	12/15/93	DPK
N310164-02	U	7285-002		1.00 g	12/06/93	12/08/93	DPK
N310164-02	U_T	7285-002		0.250 g	12/15/93	12/21/93	DPK

Verified

2/23/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-03

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z3

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-03	Client sample id	B098Z3
Dept sample id	7285-003	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/14/93
% moisture	3.6	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	2.1	3.1	4	10	U	80A
Gross Beta	Beta	23	4.7	6	10		80B
Technetium 99	14133-76-7	0.60	0.17	0.4	0.5		TC
Uranium 233/234		0.73	0.19	0.08	0.3		U
Uranium 235	15117-96-1	0.053	0.054	0.1	0.3	U	U
Uranium 238		0.68	0.19	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	2.1	0.37	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-03	80A/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	80B/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	TC	7285-003		2.00 g	12/14/93	12/15/93	DPK
N310164-03	U	7285-003		1.00 g	12/06/93	12/08/93	DPK
N310164-03	U_T	7285-003		0.250 g	12/15/93	12/21/93	DPK

Verified

2/23/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

N310164-04

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z4

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-04	Client sample id	B098Z4
Dept sample id	7285-004	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/15/93
% moisture	2.4	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	7.2	4.1	4	10	J	80A
Gross Beta	Beta	30	4.7	5	10		80B
Technetium 99	14133-76-7	0.87	0.31	0.7	0.5	—	TC
Uranium 233/234		0.58	0.17	0.1	0.3		U
Uranium 235	15117-96-1	0.037	0.050	0.1	0.3	U	U
Uranium 238		0.62	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-04	80A/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	80B/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	TC	7285-004		2.00 g	12/14/93	12/15/93	DPK
N310164-04	U	7285-004		1.00 g	12/06/93	12/08/93	DPK
N310164-04	U_T	7285-004		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

2/22/94

N310164-05

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z5

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-05	Client sample id	B098Z5
Dept sample id	7285-005	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/19/93
% moisture	6.1	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	Q TEST
Gross Alpha	Alpha	9.3	4.9	5	10	~~J~~	80A
Gross Beta	Beta	20	4.2	5	10		80B
Technetium 99	14133-76-7	0.58	0.16	0.3	0.5		TC
Uranium 233/234		0.38	0.15	0.1	0.3		U
Uranium 235	15117-96-1	0.025	0.050	0.1	0.3	U	U
Uranium 238		0.49	0.15	0.08	0.3		U

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-05	80A/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	80B/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	TC	7285-005		2.00 g	12/14/93	12/15/93	DPK
N310164-05	U	7285-005		1.00 g	12/08/93	12/13/93	DPK

Verified
2/23/94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

9413225.2292

N310164-06

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z6

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-06	Client sample id	B098Z6
Dept sample id	7285-006	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/21/93
% moisture	5.2	Chain of custody id	EFL-1091

9413225.2293

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	2.2	3.5	5	10	U	80A
Gross Beta	Beta	23	4.5	5	10		80B
Technetium 99	14133-76-7	0.47	0.10	0.2	0.5	~~J~~	TC
Uranium 233/234		0.45	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0.081	0.081	0.1	0.3	U	U
Uranium 238		0.50	0.16	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	~~*~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-06	80A/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	80B/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	TC	7285-006		2.00 g	12/14/93	12/15/93	DPK
N310164-06	U	7285-006		1.00 g	12/08/93	12/13/93	DPK
N310164-06	U_T	7285-006		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

2/23/94

N310164-07

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z7

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-07	Client sample id	B098Z7
Dept sample id	7285-007	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/21/93
% moisture	3.8	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	4.5	3.7	4	10	~~J~~	80A
Gross Beta	Beta	20	4.3	5	10		80B
Technetium 99	14133-76-7	0.23	0.065	0.1	0.5	~~J~~	TC
Uranium 233/234		0.56	0.16	0.08	0.3		U
Uranium 235	15117-96-1	0	0.026	0.1	0.3	U	U
Uranium 238		0.63	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.28	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-07	80A/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	80B/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	TC	7285-007		2.00 g	12/16/93	12/16/93	DPK
N310164-07	U	7285-007		1.00 g	12/08/93	12/18/93	DPK
N310164-07	U_T	7285-007		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

0-25

-016

N310164-09

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B098Z9

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-09	Client sample id	B098Z9
Dept sample id	7285-009	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/22/93
% moisture	4.8	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	6.1	4.1	4	10	~~J~~	80A
Gross Beta	Beta	24	4.5	5	10		80B
Technetium 99	14133-76-7	0.26	0.11	0.3	0.5	U	TC
Uranium 233/234		0.30	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0.037	0.037	0.1	0.3	U	U
Uranium 238		0.64	0.20	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.30	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-09	80A/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	80B/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	TC	7285-009		2.00 g	12/15/93	12/20/93	DPK
N310164-09	U	7285-009		1.00 g	12/10/93	12/13/93	DPK
N310164-09	U_T	7285-009		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

2/23/94

N310164-10

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B09901

SDG	7285	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N310164-10	Client sample id	B09901
Dept sample id	7285-010	Location/Matrix	200-UP-2 SOLID
Received	10/29/93	Collected	10/25/93
% moisture	9.5	Chain of custody id	EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha	6.8	3.9	4	10	~~J~~	80A
Gross Beta	Beta	17	4.4	6	10		80B
Technetium 99	14133-76-7	0.27	0.062	0.1	0.5	~~J~~	TC
Uranium 233/234		0.78	0.27	0.2	0.3		U
Uranium 235	15117-96-1	0.076	0.10	0.2	0.3	U	U
Uranium 238		0.84	0.28	0.2	0.3		U
Total Uranium (ug/g)	7440-61-1	1.9	0.34	0.03	0.1	~~X~~	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-10	80A/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	80B/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	TC	7285-010		2.00 g	12/13/93	12/16/93	DPK
N310164-10	U	7285-010		1.00 g	12/13/93	12/15/93	DPK
N310164-10	U_T	7285-010		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.27
Report date	12/29/93

2/23/94

N310164-11

TMA NORCAL
REPORTING GROUP 7285

DATA SHEET

B09903

SDG 7285 Client Westinghouse Hanford
Contact Dinkar Kharkar Contract MBH-SVV-069262

Lab sample id N310164-11 Client sample id B09903
Dept sample id 7285-011 Location/Matrix 200-UP-2 SOLID
Received 10/29/93 Collected 10/25/93
% moisture 7.5 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS Q	TEST
Gross Alpha	Alpha	11	4.7	4	10		80A
Gross Beta	Beta	15	4.2	5	10		80B
Technetium 99	14133-76-7	0.18	0.083	0.2	0.5	U	TC
Uranium 233/234		0.56	0.22	0.1	0.3		U
Uranium 235	15117-96-1	0.021	0.043	0.2	0.3	U	U
Uranium 238		0.61	0.22	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.9	0.34	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-11	80A/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	80B/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	TC	7285-011		2.00 g	12/13/93	12/20/93	DPK
N310164-11	U	7285-011		1.00 g	12/13/93	12/15/93	DPK
N310164-11	U_T	7285-011		0.250 g	12/15/93	12/21/93	DPK

Verified

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/29/93

2/23/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

GW/3225.228B

SDG: 7285 Contact: Dinkar Kharkar	TMA NORCAL REPORTING GROUP 7285	Client: Westinghouse Hanford Contract: MBH-SVV-069262

CASE NARRATIVE

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7285 is comprised of the samples listed on the Chain-of-Custody documents below. This sample group was processed under the Westinghouse Hanford Company Statement of Work P.O. MBH-SVV-069262.

1.1 Chains-of-Custody

This report includes data for the eleven soil samples from location 200-UP-2 delivered under Field Log Book No. EFL-1091. Chain-of-Custody numbers were not provided.

1.2 Sample Volume

One thousand mL plastic bottles containing the samples were received for the analyses.

1.3 Missing Samples

All samples listed on the Field Log Book documents were received.

1.4 Holding Times

The samples were collected on October 11 through October 25, 1993 and sample processing was initiated within 180 days of collection.

2.0 QUALITY CONTROL

The internal quality control consisted of one sample each of a laboratory control sample, a blank, and a replicate. All original analyses were performed with QC samples 7285-12 through 7285-14.

The QC samples were prepared by the Quality Control Department. Copies of the QC notebook pages are included in this data package.

2.1 Laboratory Control Samples

The LCS recoveries for all nuclides were acceptable. The MDA's of the results for all analyses met the RDL's.

2.2 Reagent Blanks

The results were satisfactory for all analyses. The MDA's of the results for all analyses met the RDL's.

2.0 QUALITY CONTROL (cont'd)

2.3 Duplicates

Results were satisfactory for all duplicate analyses.

3.0 ANALYSIS NOTES

3.1 Gross Alpha Analyses

The average MDA for gross alpha was (4 ± 1) pCi/g. Gross alpha activity above the RDL was found in sample BO9903.

3.2 Gross Beta Analyses

The average MDA for gross beta was (5 ± 0.9) pCi/g. Gross beta activity above the RDL was found in all of the samples.

3.3 Technetium-99 Analyses

The average yield for fourteen analyses was (50 ± 29)%. The lowest yield was 19% and the highest was 75%. The average MDA was (0.3 ± 0.3) pCi/g. Technetium-99 activity above the RDL was found in samples BO98Z2, BO98Z3, BO98Z4, and BO98Z5. The MDA of the result for sample BO98Z4 was higher than the RDL because of a low chemical yield.

3.4 Total Uranium Analyses

The average MDA was (0.03 ± 0.01) μg/g. Uranium activity ranging from (1.5 to 5.1) μg/g was found in the samples.

3.5 Isotopic Uranium Analyses

The average yield for fourteen analyses was (66 ± 16)%. The lowest yield was 54% and the highest was 77%. The average MDA was (0.1 ± 0.1) pCi/g. Uranium-233/234 and uranium-238 activity above the RDL was found in all of the samples. Samples BO9901 and BO9903 were counted for less than the nominal count time of 150 minutes. MDA's met RDL's despite the slightly shortened count times.

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-11-93

Ice Chest No. KENT

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B098Z1
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~2)~~
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

~~3)~~ RER 10-11-93
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
0920 Loren E. Rogers 10-28-93	[signature]	10-29-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9413225.2309

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

~~C 55~~

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

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

Project Designation/Sampling Locations: 200-UP-2 — Collection Date: 10-12-93

Ice Chest No.: KENT — Field Logbook No.: EFL-1091

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

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B098ZZ
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)
~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
JER 10-12-93

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

9413225.2302

[ ] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 10-28-93 Laurent E. Rogers 0920	Received by:	Date/Time: 10-28-93 10:20
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-14-93

Ice Chest No.: SML-349

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09823
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3) LER 10-14-93
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)		
Relinquished by: 10-28-93 Leon E. Rogers 0930	Received by: Francis TMA/NORCAL	Date/Time: 10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9413225.2303

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

0-59

-026

Westinghouse Hanford Company	10-15-93 CHAIN OF CUSTODY

Custody Form Initiator ~~L E ROGERS~~ W.S. Thompson

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-15-93 TIME: 1051

Ice Chest No. SML-349

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

1) B09874
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3)
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

9413225.2304

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

Relinquished by:	Received by:	Date/Time:
W.S. Thompson 1130 10-15-93	Roy T Steele	10-15-93 1130
Roy T Steele 10-28-93 0820	Lorene E. Rogers 10-28-93 0820	10-28-93 0820
Lorene E. Rogers 10-28-93 0930	TMA/NORCAL	10-29-93 12:35

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-19-93

Ice Chest No. SAL-349

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to WESTON

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09BZ5

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

2)

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

3) JER 10-19-93

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

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

Relinquished by:	Received by:	Date/Time:
10-28-93 Joseph Rogers 0930	TMA/HORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9413225.2305

0-63

-028

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

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-21-93

Ice Chest No.: SML-413

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09BZ6

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B09BZ7

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ HCL 10-21-93
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
10-28-93 Joann E. Rogers 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

9413225.2306

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

0-65

-029

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-22-93

Ice Chest No.: SML-413

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B098Z8

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) B098Z9

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~ LR 10-22-93
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody

Chain of Possession		(Sign and Print Names)
Relinquished by: 10-28-93 Loren E. Rogers 0930	Received by: TMA/HORCAL	Date/Time: 10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

-030

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: L E ROGERS

Company Contact: L E ROGERS

Telephone: 376-7690

Project Designation/Sampling Locations: 200-UP-2

Collection Date: 10-25-93

Ice Chest No.: SML-415

Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.:

Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL)

Sample Identification

1) B09901

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

2) ~~B09902~~ B09903

1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

~~3)~~

~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

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

Relinquished by:	Received by:	Date/Time:
10-28-93 0930	TMA/NORCAL	10-29-93 12:35
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

0 60

-031

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9413225.2309

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: B09821-TMA-636	
VALIDATOR: [illegible]	LAB: TMA		DATE: 02/23/94
CASE:		SDG: B09821-TMA-636	

ANALYSES PERFORMED

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

SAMPLES/MATRIX Soils

B09821	B09826	B09903
B09822	B09827	
B09823	B09828	
B09824	B09829	
B09825	B09901	

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: The initial calibration for the gas proportional counters used for gross alpha and gross beta analysis was performed more than a year from sample analysis however, since the ccv criteria was met, no qualification is required.

9413225.2310

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: The control limits for the LRG detectors were submitted by the lab under separate cover from the data package. No qualifications were required

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

Comments:

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: All tracer and chemical recoveries are acceptable with the exception of the chemical recovery for sample B09BZ4 at 19% recovery. The Tc-99 result has been qualified as estimated (J).

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:

9413225.2312

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: The sample locations are not currently available. However, field duplicate and field split samples will be evaluated in the final summary report.

10. Holding Times

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

Comments:

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: The MDA does not meet the RDL for the following samples:

Parameter	Sample ID	MDA	RDL	Units
Tc-99	B09874	0.7	0.5	pCi/g

- The laboratory reported "J" and "X" qualifiers for all samples in this data pkg. These qualifiers have been crossed off the lab result forms for clarification purposes and are not considered appropriate for radiochemistry validation. 4/24/94

Revised 4/24/94

9413225.2313

036

TMA NORCAL

REPORTING GROUP 7285

SDG 7285
Contact Dinkar Kharkar

WORK SUMMARY

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	MATRIX / SAS NO	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	# Days REVIEWED BY 3/25/94	METHOD
B098Z1		N310164-01	7285-001	80A/80		12/08/93	58	Gross Alpha in Soil
200-UP-2	SOLID	10/11/93	7285-001	80B/80		12/08/93	58	Gross Beta in Soil
EFL-1091		10/29/93	7285-001	TC		12/08/93	58	Technetium 99 in Soil
			7285-001	U		12/06/93	56	Uranium, Isotopic in Soil
			7285-001	U_T		12/15/93	65	Uranium, Total in Soil
B098Z2		N310164-02	7285-002	80A/80		12/08/93	57	Gross Alpha in Soil
200-UP-2	SOLID	10/12/93	7285-002	80B/80		12/08/93	57	Gross Beta in Soil
EFL-1091		10/29/93	7285-002	TC		12/14/93	63	Technetium 99 in Soil
			7285-002	U		12/06/93	55	Uranium, Isotopic in Soil
			7285-002	U_T		12/15/93	64	Uranium, Total in Soil
B098Z3		N310164-03	7285-003	80A/80		12/08/93	55	Gross Alpha in Soil
200-UP-2	SOLID	10/14/93	7285-003	80B/80		12/08/93	55	Gross Beta in Soil
EFL-1091		10/29/93	7285-003	TC		12/14/93	61	Technetium 99 in Soil
			7285-003	U		12/06/93	53	Uranium, Isotopic in Soil
			7285-003	U_T		12/15/93	62	Uranium, Total in Soil
B098Z4		N310164-04	7285-004	80A/80		12/09/93	55	Gross Alpha in Soil
200-UP-2	SOLID	10/15/93	7285-004	80B/80		12/09/93	55	Gross Beta in Soil
EFL-1091		10/29/93	7285-004	TC		12/14/93	60	Technetium 99 in Soil
			7285-004	U		12/06/93	52	Uranium, Isotopic in Soil
			7285-004	U_T		12/15/93	61	Uranium, Total in Soil
B098Z5		N310164-05	7285-005	80A/80		12/08/93	50	Gross Alpha in Soil
200-UP-2	SOLID	10/19/93	7285-005	80B/80		12/08/93	50	Gross Beta in Soil
EFL-1091		10/29/93	7285-005	TC		12/14/93	56	Technetium 99 in Soil
			7285-005	U		12/08/93	50	Uranium, Isotopic in Soil
B098Z6		N310164-06	7285-006	80A/80		12/08/93	48	Gross Alpha in Soil
200-UP-2	SOLID	10/21/93	7285-006	80B/80		12/08/93	48	Gross Beta in Soil
EFL-1091		10/29/93	7285-006	TC		12/14/93	54	Technetium 99 in Soil
			7285-006	U		12/08/93	48	Uranium, Isotopic in Soil
			7285-006	U_T		12/15/93	55	Uranium, Total in Soil

3/25/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.27
Report date 12/29/93

TMA NORCAL
REPORTING GROUP 7285

SDG 7285
Contact Dinkar Kharkar

WORK SUMMARY, cont.

Client Westinghouse Hanford
Contract MBH-SVV-069262

CLIENT SAMPLE ID / LOCATION / CUSTODY	MATRIX / SAS NO	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	* Days REVIEWED BY @ 3/25/94	METHOD
B098Z7		N310164-07	7285-007	80A/80		12/09/93	49	Gross Alpha in Soil
200-UP-2	SOLID	10/21/93	7285-007	80B/80		12/09/93	49	Gross Beta in Soil
EFL-1091		10/29/93	7285-007	TC		12/16/93	56	Technetium 99 in Soil
			7285-007	U		12/08/93	48	Uranium, Isotopic in Soil
			7285-007	U_T		12/15/93	55	Uranium, Total in Soil
B098Z8		N310164-08	7285-008	80A/80		12/08/93	47	Gross Alpha in Soil
200-UP-2	SOLID	10/22/93	7285-008	80B/80		12/08/93	47	Gross Beta in Soil
EFL-1091		10/29/93	7285-008	TC		12/15/93	54	Technetium 99 in Soil
			7285-008	U		12/08/93	47	Uranium, Isotopic in Soil
			7285-008	U_T		12/15/93	54	Uranium, Total in Soil
B098Z9		N310164-09	7285-009	80A/80		12/08/93	47	Gross Alpha in Soil
200-UP-2	SOLID	10/22/93	7285-009	80B/80		12/08/93	47	Gross Beta in Soil
EFL-1091		10/29/93	7285-009	TC		12/15/93	54	Technetium 99 in Soil
			7285-009	U		12/10/93	49	Uranium, Isotopic in Soil
			7285-009	U_T		12/15/93	54	Uranium, Total in Soil
B09901		N310164-10	7285-010	80A/80		12/08/93	44	Gross Alpha in Soil
200-UP-2	SOLID	10/25/93	7285-010	80B/80		12/08/93	44	Gross Beta in Soil
EFL-1091		10/29/93	7285-010	TC		12/13/93	49	Technetium 99 in Soil
			7285-010	U		12/13/93	49	Uranium, Isotopic in Soil
			7285-010	U_T		12/15/93	51	Uranium, Total in Soil
B09903		N310164-11	7285-011	80A/80		12/09/93	45	Gross Alpha in Soil
200-UP-2	SOLID	10/25/93	7285-011	80B/80		12/09/93	45	Gross Beta in Soil
EFL-1091		10/29/93	7285-011	TC		12/13/93	49	Technetium 99 in Soil
			7285-011	U		12/13/93	49	Uranium, Isotopic in Soil
			7285-011	U_T		12/15/93	51	Uranium, Total in Soil
Reagent Blank		N310164-13	7285-013	80A/80		12/09/93		Gross Alpha in Soil
	SOLID		7285-013	80B/80		12/09/93		Gross Beta in Soil
			7285-013	TC		12/16/93		Technetium 99 in Soil
			7285-013	U		12/13/93		Uranium, Isotopic in Soil
			7285-013	U_T		12/15/93		Uranium, Total in Soil

3/25/94

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.27
Report date 12/29/93

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Gross Alpha/Beta

Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09903	LCS	BLANK	B098Z2 DUP
Aliquot:	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Detector:	104	109	110	101	101	102	104	104	109	110	102	102	110	104
Count time:	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Alpha cpm:	0.27	0.38	0.14	0.34	0.36	0.16	0.2	0.37	0.23	0.28	0.37	6.06	0.04	0.38
Alpha, Bkgd:	0.072	0.057	0.064	0.092	0.091	0.086	0.064	0.072	0.057	0.064	0.082	0.086	0.051	0.072
Alpha, Xtalk:	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff:	0.113	0.124	0.132	0.143	0.125	0.126	0.125	0.137	0.117	0.135	0.125	0.106	0.106	0.11
Alpha Result Calc.:	-2.28	8.29	2.15	7.27	9.28	2.18	4.49	9.39	6.16	6.86	10.80	248.60	-0.48	9.16
Alpha Result Rptd.:	-2.50	8.21	2.13	7.24	9.30	2.17	4.47	9.40	6.11	6.83	10.70	24.80	-0.05	9.11
Alpha MDA Calc.:	4.98	4.04	4.02	4.45	5.07	4.89	4.25	4.11	4.28	3.93	4.18	5.81	4.47	5.12
Alpha MDA Rptd.:	4.98	4.06	4.05	4.44	5.09	4.88	4.24	4.10	4.27	3.93	4.19	0.58	0.45	5.10
Beta cpm:	43.53	16.89	3.44	3.86	2.92	3.31	2.94	3.13	3.25	2.94	2.59	23.5	1.29	15.11
Bkgd:	1.009	1.032	1.257	0.953	0.947	1.123	1.01	1.009	1.032	1.257	1.122	1.123	1.261	1.009
Xtalk:	0.282	0.277	0.271	0.264	0.276	0.275	0.276	0.268	0.28	0.269	0.276	0.291	0.291	0.283
Eff:	0.416	0.418	0.419	0.421	0.418	0.418	0.418	0.42	0.417	0.42	0.418	0.413	0.414	0.415
Beta Result Calc.:	459.82	169.93	23.25	30.40	20.46	23.35	20.39	21.89	23.44	17.43	14.90	225.07	0.35	152.11
Beta Result Rptd:	461.00	170.00	23.30	30.40	20.50	23.40	20.40	21.90	23.50	17.50	14.90	22.50	0.04	152.00
Beta MDA Calc:	5.07	5.10	5.62	4.87	4.89	5.32	5.05	5.02	5.11	5.60	5.32	5.39	5.69	5.08
Beta MDA rptd:	5.08	5.10	5.61	4.87	4.89	5.32	5.05	5.02	5.12	5.60	5.32	0.54	0.57	5.08

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Technetium 99

Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09903	LCS	BLANK	B098Z2 DUP
Detector:	LBG 14	LBG 9	LBG 10	LBG 11	LBG 12	LBG 13	LBG 11	LBG 11	LBG 12	LBG 11	LBG 12	LBG 13	LBG 9	LBG 12
Net, cpm:	0.17	1	0.42	0.31	0.42	0.55	0.25	0.33	0.27	0.28	0.14	13.49	0.08	1.27
Days:	58.971	57.971	55.971	57.547	53.547	51.547	51.547	50.547	54.619	49.856	49.856	0	0	65.619
Lambda:	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09	8.9E-09
Decay:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Yield:	0.6187	0.5607	0.3747	0.1887	0.3859	0.6138	0.574	0.7517	0.5674	0.5524	0.3915	0.3167	0.5386	0.5237
Aliquot:	2	2	2	2	2	2	2	2	2	2	2	2	2	2
P-Factor:	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Count, time:	103.6	195.7	195.7	195.7	195.7	195.7	504	136.4	136.4	761.6	761.6	761.6	183.8	504
Bkg., cpm:	0.49	0.54	0.55	0.5	0.55	0.45	0.5	0.5	0.55	0.5	0.55	0.45	0.54	0.55
Result, calc.:	0.14	0.94	0.59	0.87	0.57	0.47	0.23	0.23	0.25	0.27	0.19	22.45	0.08	1.28
Result, rptd.:	0.14	0.94	0.60	0.87	0.58	0.47	0.23	0.23	0.26	0.27	0.18	22.45	0.08	1.28
MDA, calc.:	0.27	0.23	0.35	0.66	0.34	0.19	0.13	0.20	0.27	0.11	0.17	0.19	0.25	0.15
MDA, rptd.:	0.30	0.25	0.38	0.70	0.35	0.21	0.14	0.21	0.29	0.12	0.17	0.20	0.27	0.16

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Uranium 233/4/5/8

Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09903	LCS	BLANK	B098Z2 DUP
Detector:	SS-19	SS-20	SS-21	SS-24	SS-19	SS-20	SS-21	SS-26	SS-26	SS-20	SS-21	SS-23	SS-26	SS-20
Sample count time:	214.2	214.2	214.2	214.2	231.08	231.08	231.08	231.08	165.42	149.42	149.42	386.6	149.08	141.43
GMT count:	340.953	340.953	340.953	340.953	343.013	343.013	343.013	343.013	344.683	347.997	347.997	355.82	347.997	351
Zero time:	284.292	285.292	287.292	288.292	292.292	294.292	294.292	295.292	295.292	298.292	298.292	355.82	347.997	284.292
Corr. tracer dpm:	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49
Bkgd count time:	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2383.07	2383.07	1132.27	2383.07	2383.07
Net tracer counts:	445	330	429	457	457	423	435	451	310	225	269	917	242	219
Detector eff.:	0.261	0.2675	0.2479	0.3185	0.2647	0.2675	0.2476	0.2803	0.284	0.2671	0.2463	0.3121	0.2833	0.2654
Yield:	0.7599	0.5499	0.7715	0.6396	0.7135	0.6534	0.7261	0.6649	0.6302	0.5385	0.6981	0.7259	0.5472	0.5573
U-238, gross counts:	98	157	62	61	48	47	58	74	42	40	35	1120	4	128
U-238, bkgd counts:	2	2	0	1	1	2	0	1	0	0	0	62	0	1
U-238, Lambda:	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13	4.23E-13
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	12	15	5	4	3	7	1	3	2	3	1	614	0	10
U-235, bkgd counts:	1	1	1	1	1	1	1	0	0	0	0	2	0	0
U-235, Lambda:	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12	2.67E-12
U-235, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts:	89	169	68	60	42	44	54	58	22	38	33	1030	7	112
U-233/4, bkgd counts:	5	5	2	4	5	4	2	4	2	1	1	72	2	2
U-233/4, Lambda:	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08	1.17E-08
U-233/4, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Aliquot:	1	1	1	1	1	1	1	1	1	1	1	1	1	1
U-238, result calc.:	1.02	2.22	0.68	0.62	0.49	0.50	0.63	0.76	0.64	0.84	0.61	5.44	0.08	2.73
U-238, result rptd:	1.02	2.22	0.68	0.62	0.49	0.50	0.63	0.76	0.64	0.84	0.61	5.44	0.08	2.74
U-238 MDA calc.:	0.08	0.11	0.08	0.08	0.08	0.09	0.08	0.08	0.12	0.16	0.13	0.19	0.15	0.17
U-238, MDA rptd.:	0.08	0.11	0.08	0.08	0.08	0.09	0.08	0.08	0.12	0.16	0.13	0.19	0.15	0.17
U-235, result calc.:	0.14	0.24	0.05	0.04	0.02	0.08	0.00	0.04	0.04	0.08	0.02	3.81	0.00	0.26
U-235, result rptd.:	0.14	0.24	0.05	0.04	0.02	0.08	0.00	0.04	0.04	0.08	0.02	3.81	0.00	0.26
U-235, MDA calc.:	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.14	0.19	0.16	0.05	0.18	0.20
U-235, MDA rptd.:	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.14	0.19	0.16	0.05	0.18	0.20
U-233/4, result calc.:	0.89	2.34	0.73	0.58	0.38	0.45	0.56	0.56	0.30	0.78	0.56	4.93	0.10	2.37
U-233/4, result rptd.:	0.88	0.23	0.73	0.58	0.38	0.45	0.56	0.56	0.30	0.78	0.56	4.93	0.10	2.37
U-233/4, MDA calc.:	0.11	0.15	0.08	0.10	0.11	0.10	0.08	0.10	0.12	0.16	0.13	0.20	0.15	0.17
U-233/4, MDA rptd.:	0.14	0.18	0.08	0.11	0.13	0.12	0.08	0.12	0.15	0.16	0.13	0.22	0.19	0.21

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636
Total Uranium

Standard	Intensity			ug/L	ug/L	Amount	Prep.		Calc	Rptd
0.049	534	Sample ID	Intens.	Calc.	Rptd	of Smpl	Volume	Dilution	Result	Rslt
0.156	1346	B098Z1	28475	3.261	3.58478	0.25	0.02	10	2.87	2.90
0.521	4460	B098Z2	50969	5.837	6.33276	0.25	0.02	10	5.07	5.09
0.976	8440	B098Z3	20939	2.398	2.57217	0.25	0.02	10	2.06	2.06
2.603	21956	B098Z4	15355	1.758	1.86486	0.25	0.02	10	1.49	1.49
4.881	41542	B098Z6	15286	1.750	1.8764	0.25	0.02	10	1.50	1.50
16.27	129728	B098Z7	16125	1.847	1.91936	0.25	0.02	10	1.54	1.54
		B098Z8	17565	2.011	2.14731	0.25	0.02	10	1.72	1.72
Slope:	1.1E-04	B098Z9	17066	1.954	2.05607	0.25	0.02	10	1.64	1.65
		B09901	19289	2.209	2.35082	0.25	0.02	10	1.88	1.88
		B09903	18409	2.108	2.32018	0.25	0.02	10	1.86	1.86
		LCS	33587	3.846	3.78175	0.25	0.02	10	3.03	3.02
		BLANK	-584	-0.067	0.036	0.25	0.02	1	0.003	0.003
		B098Z2 DUP	51139	5.856	6.57246	0.25	0.02	10	5.26	5.26