

Date: 3 January 2000  
 To: Bechtel Hanford, Inc. (technical representative)  
 From: TechLaw, Inc.  
 Project: 100-D Areas - Full Protocol - North Pipelines Overburden  
 Subject: Radiochemistry - Data Package No. H0490-TNU (SP-0 No. H0490)

**RECEIVED**  
 APR 25 2000

## INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0490-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0W4Y0	8/11/99	Soil	C	See note 1
B0W4Y1	8/11/99	Soil	C	See note 1
B0W4Y2	8/11/99	Soil	C	See note 1
B0W4Y3	8/11/99	Soil	C	See note 1
B0W4Y4	8/11/99	Soil	C	See note 1
B0W4Y5	8/11/99	Soil	C	See note 1
B0W4Y6	8/11/99	Soil	C	See note 1
B0W4Y7	8/10/99	Soil	C	See note 1
B0W4Y8	8/10/99	Soil	C	See note 1
B0W4Y9	8/10/99	Soil	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium/plutonium); total strontium.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1-5 provide the following information as indicated below:

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

## DATA QUALITY OBJECTIVES

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Blanks**

### Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is either 70-130% or  $\pm 3$  sigma. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

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- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 30 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

#### Field Duplicate Samples

One pair of field duplicate samples (samples BOW4Y3/BOW4Y4) were submitted to TNU for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the contract specified MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes were reported above their TDL: Uranium-238(gea) in sample BOW4Y0; plutonium-238, europium-155 and uranium-238(gea) in sample BOW4Y1; plutonium-238, plutonium-239/240, europium-155 and uranium-238(gea) in sample BOW4Y2; europium-155, americium-241(gea) and uranium-238(gea) in samples BOW4Y3; europium-155 and uranium-238(gea) in samples BOW4Y4 and BOW4Y5; plutonium-238, plutonium-239/240 and uranium-238(gea) in sample BOW4Y6; uranium-235(aspec), americium-241(gea) and uranium-238(gea) in sample BOW4Y7; uranium-238(gea) in sample BOW4Y8; and uranium-235(aspec), plutonium-238, plutonium-239/240, europium-155, uranium-238(gea) and uranium-235(gea) in sample BOW4Y9. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

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- **Completeness**

Data Package No. H0490 (SDG No. H0490) was submitted for validation and verified for completeness. The completion rate was 100%.

## **MAJOR DEFICIENCIES**

None found.

## **MINOR DEFICIENCIES**

The following analytes were reported above their TDL: Uranium-238(gea) in sample BOW4Y0; plutonium-238, europium-155 and uranium-238(gea) in sample BOW4Y1; plutonium-238, plutonium-239/240, europium-155 and uranium-238(gea) in sample BOW4Y2; europium-155, americium-241(gea) and uranium-238(gea) in samples BOW4Y3; europium-155 and uranium-238(gea) in samples BOW4Y4 and BOW4Y5; plutonium-238, plutonium-239/240 and uranium-238(gea) in sample BOW4Y6; uranium-235(aspec), americium-241(gea) and uranium-238(gea) in sample BOW4Y7; uranium-238(gea) in sample BOW4Y8; and uranium-235(aspec), plutonium-238, plutonium-239/240, europium-155, uranium-238(gea) and uranium-235(gea) in sample BOW4Y9. Under the BHI statement of work, no qualification is required.

## **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

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Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- U** - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ** - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J** - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R** - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR** - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

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**Appendix 2**

**Summary of Data Qualification**

000007

DATA QUALIFICATION SUMMARY

SDG: H0490	REVIEWER: TLI	DATE: 1/3/00	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON



**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

Project: BECHTEL-HANFORD																					
Laboratory: TNU																					
Case		SDG: H0490																			
Sample Number		BOW4Y0		BOW4Y1		BOW4Y2		BOW4Y3		BOW4Y4		BOW4Y5		BOW4Y6		BOW4Y7		BOW4Y8		BOW4Y9	
Location		NPO		NPO		NPO		NPO		NPO		NPO		NPO		NPO		NPO		NPO	
Remarks		L7		L8		M9		M10		Duplicate		M2		M1		N3		N4		N5	
Sample Date		08/11/99		08/11/99		08/11/99		08/11/99		08/11/99		08/11/99		08/11/99		08/10/99		08/10/99		08/10/99	
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Uranium-234	0.1	0.402		0.586		0.550		0.504		0.653		0.515		0.482		0.541		0.504		0.475	
Uranium-235	0.1	0.041	U	0.047	U	0.043	U	0.053	U	0.010	U	0.031	U	0.019	U	0.014	U	0.056	U	0	U
Uranium-238	0.1	0.411		0.519		0.382		0.452		0.542		0.481		0.375		0.530		0.443		0.552	
Plutonium-238	0.1	-0.004	U	-0.031	U	0.016	U	-0.007	U	-0.007	U	-0.005	U	-0.016	U	-0.016	U	0.014	U	-0.040	U
Plutonium-239/40	0.1	0	U	-0.031	U	-0.016	U	-0.007	U	-0.007	U	-0.021	U	-0.016	U	-0.011	U	0.029	U	-0.030	U
Strontium (total)	1	-0.094	U	0.042	U	0.081	U	-0.053	U	0.008	U	0.051	U	-0.060	U	-0.009	U	0.054	U	0.005	U
Potassium-40		11.6		9.81		10.3		11.4		11.6		10.1		9.57		10.7		11.0		9.27	
Cobalt 60	0.05		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U
Cesium 137	0.05		U U		U U		U U		U U	0.020			U U		U U		U U		U U		U U
Europium 152	0.1		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U
Europium 154	0.1		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U
Europium 155	0.05		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U
Radium-226		0.474		0.396		0.377		0.502		0.530		0.423		0.361		0.426		0.478		0.365	
Radium-228		0.639		0.518		0.566		0.706		0.648		0.540		0.546		0.626		0.744		0.455	
Thorium-228		0.583		0.519		0.505		0.579		0.675		0.546		0.492		0.547		0.598		0.500	
Thorium-232		0.639		0.518		0.566		0.706		0.648		0.540		0.546		0.626		0.744		0.455	
Americium-241 (GEA)	0.1		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U
Uranium-238 (GEA)	0.1		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U
Uranium-235 (GEA)	0.1		U U		U U		U U		U U		U U		U U		U U		U U		U U		U U

000010

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-01

BOW4Y0

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-01</u>	Client sample id <u>BOW4Y0</u>	
Dept sample id <u>7176-001</u>	Location/Matrix <u>100D NPL OVB Stockpiles</u>	<u>SOLID</u>
Received <u>08/14/99</u>	Collected <u>08/11/99 08:55</u>	
% solids <u>99.3</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.402	0.12	0.082	1.0	J	U
Uranium 235	15117-96-1	0.041	0.042	0.079	1.0	U	U
Uranium 238	U-238	0.411	0.12	0.065	1.0	J	U
Plutonium 238	13981-16-3	-0.004	0.017	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.017	0.046	1.0	U	PU
Total Strontium	SR-RAD	-0.094	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	11.6	0.46	0.21			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.019	0.10	U	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.077	0.10	U	GAM
Europium 155	14391-16-3	U		0.043	0.10	U	GAM
Radium 226	13982-63-3	0.474	0.041	0.039	0.10		GAM
Radium 228	15262-20-1	0.639	0.097	0.092	0.20		GAM
Thorium 228	14274-82-9	0.583	0.026	0.024			GAM
Thorium 232	TH-232	0.639	0.097	0.092			GAM
Americium 241	14596-10-2	U		0.033		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	U		0.072		U	GAM

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12/22/99

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-02

B0W4Y1

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-02</u>	Client sample id <u>B0W4Y1</u>	
Dept sample id <u>7176-002</u>	Location/Matrix <u>100D NPL OVB Stockpiles</u>	<u>SOLID</u>
Received <u>08/14/99</u>	Collected <u>08/11/99 08:45</u>	
% solids <u>99.1</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.586	0.16	0.092	1.0	J	U
Uranium 235	15117-96-1	0.047	0.047	0.089	1.0	U	U
Uranium 238	U-238	0.519	0.14	0.074	1.0	J	U
Plutonium 238	13981-16-3	-0.031	0.046	0.12	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.031	0.031	0.094	1.0	U	PU
Total Strontium	SR-RAD	0.042	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	9.81	0.43	0.24			GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Cesium 137	10045-97-3	U		0.020	0.10	U	GAM
Europium 152	14683-23-9	U		0.049	0.10	U	GAM
Europium 154	15585-10-1	U		0.069	0.10	U	GAM
Europium 155	14391-16-3	U		0.057	0.10	U	GAM
Radium 226	13982-63-3	0.396	0.037	0.037	0.10		GAM
Radium 228	15262-20-1	0.518	0.093	0.097	0.20		GAM
Thorium 228	14274-82-9	0.519	0.025	0.027			GAM
Thorium 232	TH-232	0.518	0.093	0.097			GAM
Americium 241	14596-10-2	U		0.072		U	GAM
Uranium 238	U-238	U		2.6		U	GAM
Uranium 235	15117-96-1	U		0.074		U	GAM

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-03

B0W4Y2

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-03</u>	Client sample id <u>B0W4Y2</u>	
Dept sample id <u>7176-003</u>	Location/Matrix <u>100D NPL OVB Stockpiles SOLID</u>	
Received <u>08/14/99</u>	Collected <u>08/11/99 08:40</u>	
‡ solids <u>99.4</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.550	0.15	0.068	1.0	J	U
Uranium 235	15117-96-1	0.043	0.043	0.082	1.0	U	U
Uranium 238	U-238	0.382	0.13	0.068	1.0	J	U
Plutonium 238	13981-16-3	0.016	0.047	0.11	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.016	0.047	0.12	1.0	U	PU
Total Strontium	SR-RAD	0.081	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	10.3	0.26	0.093			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Europium 152	14683-23-9	U		0.028	0.10	U	GAM
Europium 154	15585-10-1	U		0.038	0.10	U	GAM
Europium 155	14391-16-3	U		0.057	0.10	U	GAM
Radium 226	13982-63-3	0.377	0.024	0.021	0.10		GAM
Radium 228	15262-20-1	0.566	0.059	0.054	0.20		GAM
Thorium 228	14274-82-9	0.505	0.016	0.014			GAM
Thorium 232	TH-232	0.566	0.059	0.054			GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	U		1.4		U	GAM
Uranium 235	15117-96-1	U		0.047		U	GAM

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12/27/99

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Lab id <u>TMNC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-04

B0W4Y3

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-04</u>	Client sample id <u>B0W4Y3</u>	
Dept sample id <u>7176-004</u>	Location/Matrix <u>100D NPL OVB Stockpiles SOLID</u>	
Received <u>08/14/99</u>	Collected <u>08/11/99 08:20</u>	
‡ solids <u>99.0</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.504	0.15	0.067	1.0	J	U
Uranium 235	15117-96-1	0.053	0.042	0.081	1.0	U	U
Uranium 238	U-238	0.452	0.13	0.067	1.0	J	U
Plutonium 238	13981-16-3	-0.007	0.044	0.099	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.007	0.030	0.082	1.0	U	PU
Total Strontium	SR-RAD	-0.053	0.13	0.18	1.0	U	SR
Potassium 40	13966-00-2	11.4	0.37	0.17			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Europium 152	14683-23-9	U		0.041	0.10	U	GAM
Europium 154	15585-10-1	U		0.058	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Radium 226	13982-63-3	0.502	0.032	0.029	0.10		GAM
Radium 228	15262-20-1	0.706	0.081	0.079	0.20		GAM
Thorium 228	14274-82-9	0.579	0.023	0.023			GAM
Thorium 232	TH-232	0.706	0.081	0.079			GAM
Americium 241	14596-10-2	U		0.16		U	GAM
Uranium 238	U-238	U		1.9		U	GAM
Uranium 235	15117-96-1	U		0.073		U	GAM

100 D Areas - Full Protocol

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

000014

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-05

B0W4Y4

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-05</u>	Client sample id <u>B0W4Y4</u>	
Dept sample id <u>7176-005</u>	Location/Matrix <u>100D NPL OVB Stockpiles SOLID</u>	
Received <u>08/14/99</u>	Collected <u>08/11/99 08:20</u>	
* solids <u>99.0</u>	Custody/SAF No <u>B99-005-38</u> <u>B99-005</u>	

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.653	0.15	0.076	1.0	J	U
Uranium 235	15117-96-1	0.010	0.019	0.074	1.0	U	U
Uranium 238	U-238	0.542	0.14	0.061	1.0	J	U
Plutonium 238	13981-16-3	-0.007	0.028	0.068	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.007	0.043	0.087	1.0	U	PU
Total Strontium	SR-RAD	0.008	0.12	0.16	1.0	U	SR
Potassium 40	13966-00-2	11.6	0.36	0.19			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	0.020	0.012	0.016	0.10	J	GAM
Europium 152	14683-23-9	U		0.038	0.10	U	GAM
Europium 154	15585-10-1	U		0.061	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Radium 226	13982-63-3	0.530	0.033	0.030	0.10		GAM
Radium 228	15262-20-1	0.648	0.076	0.074	0.20		GAM
Thorium 228	14274-82-9	0.675	0.021	0.020			GAM
Thorium 232	TH-232	0.648	0.076	0.074			GAM
Americium 241	14596-10-2	U		0.023		U	GAM
Uranium 238	U-238	U		2.1		U	GAM
Uranium 235	15117-96-1	U		0.057		U	GAM

100 D Areas - Full Protocol

*[Signature]*  
12/27/99

000015

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-06

BOW4Y5

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-06</u>	Client sample id <u>BOW4Y5</u>	
Dept sample id <u>7176-006</u>	Location/Matrix <u>100D NPL OVB Stockpiles SOLID</u>	
Received <u>08/14/99</u>	Collected <u>08/11/99 07:55</u>	
% solids <u>99.2</u>	Custody/SAF No <u>B99-005-38</u> <u>B99-005</u>	

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.515	0.14	0.082	1.0	J	U
Uranium 235	15117-96-1	0.031	0.042	0.080	1.0	U	U
Uranium 238	U-238	0.481	0.13	0.066	1.0	J	U
Plutonium 238	13981-16-3	-0.005	0.032	0.072	1.0	U	FU
Plutonium 239/240	PU-239/240	-0.021	0.021	0.072	1.0	U	FU
Total Strontium	SR-RAD	0.051	0.11	0.15	1.0	U	SR
Potassium 40	13966-00-2	10.1	0.33	0.17			GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	U		0.014	0.10	U	GAM
Europium 152	14683-23-9	U		0.037	0.10	U	GAM
Europium 154	15585-10-1	U		0.048	0.10	U	GAM
Europium 155	14391-16-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	0.423	0.027	0.026	0.10		GAM
Radium 228	15262-20-1	0.540	0.064	0.066	0.20		GAM
Thorium 228	14274-82-9	0.546	0.018	0.018			GAM
Thorium 232	TH-232	0.540	0.064	0.066			GAM
Americium 241	14596-10-2	U		0.055		U	GAM
Uranium 238	U-238	U		1.8		U	GAM
Uranium 235	15117-96-1	U		0.094		U	GAM

100 D Areas - Full Protocol

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12/22/99

DATA SHEETS

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000016

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>



TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0490

N908078-07

B0W4Y6

DATA SHEET

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-07</u>	Client sample id <u>B0W4Y6</u>	
Dept sample id <u>7176-007</u>	Location/Matrix <u>100D NPL OVB Stockpiles SOLID</u>	
Received <u>08/14/99</u>	Collected <u>08/11/99 08:05</u>	
% solids <u>99.1</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.482	0.13	0.059	1.0	J	U
Uranium 235	15117-96-1	0.019	0.019	0.071	1.0	U	U
Uranium 238	U-238	0.375	0.11	0.059	1.0	J	U
Plutonium 238	13981-16-3	-0.016	0.049	0.12	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.016	0.049	0.11	1.0	U	PU
Total Strontium	SR-RAD	-0.060	0.11	0.16	1.0	U	SR
Potassium 40	13966-00-2	9.57	0.19	0.082			GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.10	U	GAM
Europium 152	14683-23-9	U		0.020	0.10	U	GAM
Europium 154	15585-10-1	U		0.028	0.10	U	GAM
Europium 155	14391-16-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	0.361	0.018	0.016	0.10		GAM
Radium 228	15262-20-1	0.546	0.041	0.038	0.20		GAM
Thorium 228	14274-82-9	0.492	0.012	0.010			GAM
Thorium 232	TH-232	0.546	0.041	0.038			GAM
Americium 241	14596-10-2	U		0.026		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.044		U	GAM

100 D Areas - Full Protocol

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

000017

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-08

BOW4Y7

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-08</u>	Client sample id <u>BOW4Y7</u>	
Dept sample id <u>7176-008</u>	Location/Matrix <u>100D NPL OVB Stockpiles</u>	<u>SOLID</u>
Received <u>08/14/99</u>	Collected <u>08/10/99 10:10</u>	
% solids <u>99.1</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.541	0.17	0.088	1.0	J	U
Uranium 235	15117-96-1	0.014	0.028	0.11	1.0	U	U
Uranium 238	U-238	0.530	0.17	0.088	1.0	J	U
Plutonium 238	13981-16-3	-0.016	0.032	0.072	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.011	0.022	0.066	1.0	U	PU
Total Strontium	SR-RAD	-0.009	0.12	0.16	1.0	U	SR
Potassium 40	13966-00-2	10.7	0.27	0.12			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.012	0.10	U	GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.042	0.10	U	GAM
Europium 155	14391-16-3	U		0.043	0.10	U	GAM
Radium 226	13982-63-3	0.426	0.026	0.025	0.10		GAM
Radium 228	15262-20-1	0.626	0.054	0.052	0.20		GAM
Thorium 228	14274-82-9	0.547	0.017	0.017			GAM
Thorium 232	TH-232	0.626	0.054	0.052			GAM
Americium 241	14596-10-2	U		0.11		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Uranium 235	15117-96-1	U		0.053		U	GAM

100 D Areas - Full Protocol

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12/27/99

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0490**

N908078-09

BOW4Y8

**DATA SHEET**

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-09</u>	Client sample id <u>BOW4Y8</u>	
Dept sample id <u>7176-009</u>	Location/Matrix <u>100D NPL OVB Stockpiles SOLID</u>	
Received <u>08/14/99</u>	Collected <u>08/10/99 10:00</u>	
‡ solids <u>99.1</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.504	0.13	0.073	1.0	J	U
Uranium 235	15117-96-1	0.056	0.037	0.071	1.0	U	U
Uranium 238	U-238	0.443	0.13	0.058	1.0	J	U
Plutonium 238	13981-16-3	0.014	0.019	0.037	1.0	U	PU
Plutonium 239/240	PU-239/240	0.029	0.029	0.046	1.0	U	PU
Total Strontium	SR-RAD	0.054	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	11.0	0.50	0.26			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.10	U	GAM
Europium 152	14683-23-9	U		0.052	0.10	U	GAM
Europium 154	15585-10-1	U		0.077	0.10	U	GAM
Europium 155	14391-16-3	U		0.048	0.10	U	GAM
Radium 226	13982-63-3	0.478	0.048	0.045	0.10		GAM
Radium 228	15262-20-1	0.744	0.12	0.11	0.20		GAM
Thorium 228	14274-82-9	0.598	0.026	0.024			GAM
Thorium 232	TH-232	0.744	0.12	0.11			GAM
Americium 241	14596-10-2	U		0.030		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.076		U	GAM

100 D Areas - Full Protocol

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DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/99</u>

TMA / RICHMOND  
 SAMPLE DELIVERY GROUP H0490

N908078-10

BOW4Y9

DATA SHEET

SDG <u>7176</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0490</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N908078-10</u>	Client sample id <u>BOW4Y9</u>	
Dept sample id <u>7176-010</u>	Location/Matrix <u>100D NPL OVB Stockpiles</u>	<u>SOLID</u>
Received <u>08/14/99</u>	Collected <u>08/10/99 09:50</u>	
% solids <u>98.9</u>	Custody/SAF No <u>B99-005-38</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.475	0.16	0.098	1.0	J	U
Uranium 235	15117-96-1	0	0.031	0.12	1.0	U	U
Uranium 238	U-238	0.552	0.19	0.098	1.0	J	U
Plutonium 238	13981-16-3	-0.040	0.040	0.13	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.030	0.040	0.11	1.0	U	PU
Total Strontium	SR-RAD	0.005	0.14	0.18	1.0	U	SR
Potassium 40	13966-00-2	9.27	0.40	0.21			GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Cesium 137	10045-97-3	U		0.018	0.10	U	GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.057	0.10	U	GAM
Europium 155	14391-16-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	0.365	0.035	0.034	0.10		GAM
Radium 228	15262-20-1	0.455	0.085	0.090	0.20		GAM
Thorium 228	14274-82-9	0.500	0.022	0.022			GAM
Thorium 232	TH-232	0.455	0.085	0.090			GAM
Americium 241	14596-10-2	U		0.068		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Uranium 235	15117-96-1	U		0.16		U	GAM

100 D Areas - Full Protocol

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12/27/99

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.05</u>
Report date <u>09/28/99</u>

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## **Appendix 4**

### **Laboratory Narrative and Chain-of-Custody Documentation**

**000021**

## Case Narrative

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### 1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0490 is composed of ten solid (soil) samples designated under SAF No. B99-005 with a Project Designation of: 100 D Areas-Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklists. The results were transmitted to BHI via facsimile on September 8, 1999 with the exception of the Gamma Scan results, which were faxed to Bechtel Hanford on September 28, 1999.

### 2.0 ANALYSIS NOTES

#### 2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

#### 2.2 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses. A recount was performed on sample B0W4Y3 as well as the LCS.

#### 2.3 Gamma Spec Analyses

No problems were encountered during the course of the analyses

#### 2.4 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses. A reanalysis was performed on B0W4Y0 due to a low tracer. The reanalysis results are reported for sample B0W4Y0 along with Quality Control sample results for the reanalysis. The duplicate was performed on sample B0W4Y0 however the duplicate result was acceptable and therefore a reanalysis was not performed.

Decanter Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-005-038

Page 1 of 2

Collector Kerkow / Behnke	Company Contact RB Kerkow	Telephone No. 373-4887	Project Coordinator TRENT, SJ	Price Code	Data Turnaround <b>15 Days</b>
Project Designation 100 D Areas - Full Protocol	Sampling Location 100D NPL OVB Stockpiles	Field Logbook No. EL-1339-5	Method of Shipment -Government Vehicle <b>MA 81399 FED EX</b>		
Ice Chest No. <b>ERC 96:051</b>	Offsite Property No. <b>AGP10204</b>	Bill of Lading/Air Bill No. <b>423579528407</b>			
Shipped To <b>TMA/DBB DBB 8-11-99</b>	COA <b>R100 DC 2 F00</b>				

POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive	Preservation	None	Cool 4C																
	Type of Container	P	uG																
	No. of Container(s)	1	1																
	Special Handling and/or Storage	Volume	1L	60mL															

SAMPLE ANALYSIS		See item (1) in Special Instructions.	Chromium Max - 7196																
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Sample No.	Matrix *	Sample Date	Sample Time																
B0W4Y0	Soil	8-11-99	0855	X															
B0W4Y1	Soil	8-11-99	0845	X															
B0W4Y2	Soil	8-11-99	0840	X															
B0W4Y3	Soil	8-11-99	0820	X															
B0W4Y4	Soil	8-11-99	0820	X															

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>DB Behnke</i> Date/Time <b>8-11-99 1230</b>	Received By <i>Ref IC</i> Date/Time	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr  <b>NOTE: COLLECTOR UNAVAILABLE TO SIGN COC.</b>	Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>REF IC</i> Date/Time <b>8/13/99 1230</b>	Received By <i>SSGALW</i> Date/Time <b>8/13/99 1230</b>		
Relinquished By <i>SJGALE</i> Date/Time <b>8/13/99 1230</b>	Received By <i>FED EX</i> Date/Time <b>8-13-99</b>		
Relinquished By <i>FedEx</i> Date/Time <b>8-14-99 1715</b>	Received By <i>TNU McColubberg</i> Date/Time <b>8-14-99</b>		

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

000023

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector Kerkow / Behnke	Company Contact RD Kerkow	Telephone No. 373-4887	Project Coordinator TRENZ, SJ	Price Code	Date Turnaround <b>15 Days</b>
Project Designation 100 D Areas - Full Protocol	Sampling Location 100D NPL OVB Stockpiles	SAF No. B99-005			
Ice Chest No. <b>ERC 96 051</b>	Field Logbook No. EL-1339-5	Method of Shipment <b>Delivered 8/13/99 FED EX</b> Government Vehicle			
Shipped To TMA/REBOR <b>DOB 8-11-99</b>	Offsite Property No. <b>APM0204</b>	Bill of Lading/Air Bill No. <b>423579528407</b>			
			COA <b>R100DC 2F00</b>		

POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive  Special Handling and/or Storage  <b>000024</b>	Preservation	None	Cool 4C										
	Type of Container	P	20										
	No. of Container(s)	1	1										
	Volume	1L	60mL										

SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196								
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Sample No.	Matrix *	Sample Date	Sample Time										
BOW4Y5	Soil	8-11-99	0755	X									
BOW4Y6	Soil	8-11-99	0805	X									
<del>BOW4Y7</del>	<del>Soil</del>	<del>DOB 8-10-99</del>											
<del>BOW4Y8</del>	<del>Soil</del>	<del>DOB 8-10-99</del>											
<del>BOW4Y9</del>	<del>Soil</del>	<del>DOB 8-10-99</del>											

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>DB Behnke</i>	Date/Time 9-11-99 1700	Received By <i>Ref 1C</i>	Date/Time
Relinquished By <i>REF 1C</i>	Date/Time 12:30 8/13/99	Received By <i>SJOALW</i>	Date/Time 8/13/99 1230
Relinquished By <i>WALKE</i>	Date/Time 8/13/99 1230	Received By <i>FED EX</i>	Date/Time 8-13-99
Relinquished By <i>FedEx</i>	Date/Time 8-14-99 11:15	Received By <i>TNU M. Goldenberg</i>	Date/Time 8-14-99

SPECIAL INSTRUCTIONS  (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr  NOTE: COLLECTOR UNAVAILABLE TO SIGN COC	Matrix * Soil Water Vapor Other Solid Other Liquid
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LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time



Collector Kerkow / Behnke	Company Contact RD Kerkow	Telephone No. 373-4887	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 100D NPL OVB Stockpiles	SAF No. B99-005			
Ice Chest No. ERC 96-068	Field Logbook No. EL-1339-5	Method of Shipment Government Vehicle Fed Ex CK 8/11/99			
Shipped To TMA/RECR 266 24-57	Offsite Property No. A990203	Bill of Lading/Air Bill No. 423579528370			
			COA	R100 DC 2FOO	

POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive	Preservation	None	Cool 4C							
	Type of Container	P	uG							
	No. of Container(s)	1	1							
	Special Handling and/or Storage	Volume	1L	60mL						

SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196								

Sample No.	Matrix #	Sample Date	Sample Time								
B0W4Y5	Soil		030 8-10-99								
B0W4Y6	Soil		088 8-10-99								
✓ B0W4Y7	Soil	8-10-99	1010	X							N3
✓ B0W4Y8	Soil	8-10-99	1000	X							N4
✓ B0W4Y9	Soil	8-10-99	0950	X							N5

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix # Soil Water Vapor Other Solid Other Liquid	
	Relinquished By <i>D.B. Behnke</i>	Date/Time 8-10-99 1715	Received By <i>R&amp;F: IB</i>	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr				
	Relinquished By <i>R&amp;F IB</i>	Date/Time 8/13/99 1230	Received By <i>SJGALC/Alph</i>	NOTE: COLLECTOR UNAVAILABLE TO SIGN COC				
	Relinquished By <i>SJGALC/Alph</i>	Date/Time 8/13/99 1230	Received By <i>FED EX.</i>	8-13-99				
Relinquished By <i>Fed Ex</i>	Date/Time 8-14-99 11:15	Received By <i>Alph</i>	8-14-99					
LABORATORY SECTION	Received By	Title				Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time		

**Appendix 5**

**Data Validation Supporting Documentation**

**000026**

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	North Pipeline		DATA PACKAGE: H0490		
VALIDATOR:	TLI	LAB: TNV	DATE: 12/16/99		
CASE:	SDG: H0490				
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX Bow440 Bow441 Bow442					
Bow443 Bow444 Bow445 Bow446					
Bow447 Bow448 Bow449					
soil					

1. Completeness . . . . .  N/A  
 Technical verification forms present? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. Initial Calibration . . . . .  N/A  
 Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A  
 Initial calibration acceptable? . . . . . Yes No N/A  
 Standards NIST traceable? . . . . . Yes No N/A  
 Standards Expired? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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: 443 / 444 PD  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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: 443 / 444

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: Y0 - U238 Y1 - eu155<sup>pu238</sup> U-238 Y2 - pu238 / 239/40, 155, 238  
Y3 - eu155 am241 (gen) U238 (gen) Y4 - 155, 238  
Y5 - 155, 238 Y6 - pu238 - 239/40, U238 Y7 - U235 (aspec) Am241 (gen) U238  
Y8 - U238 (gen) ~~Y8~~ Y9 - U235 (aspec) pu238, pu239/40, U238 (gen)  
eu155, U238, U235 gen

000030

<b>Review Comment Record (RCR)</b>	1. Date 1/14/00	2. Review No. BHI/QA0005
	3. Project 100-D	4. Page Page 1 of 1

5. Document Number(s)/Title(s)  SDG No. H0490	6. Program/Project/ Building Number 100-D Areas – Full Protocol – North Pipelines Overburden	7. Reviewer  Claude Stacey	8. Organization/Group  BHI/QA	9. Location/Phone  H0-16/372-9208
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17. Comment Submittal Approval: \_\_\_\_\_ 10. Agreement with indicated comment disposition(s) \_\_\_\_\_ 11. CLOSED

\_\_\_\_\_  
Organization Manager (Optional)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Reviewer/Point of Contact

\_\_\_\_\_  
Date

\_\_\_\_\_  
Reviewer/Point of Contact

\_\_\_\_\_  
Author/Originator

\_\_\_\_\_  
Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Radiochemistry: OK No Comments			
2				
3				

## REVIEW OF VALIDATION PACKAGES – R.L. WEISS - JAN. 13, 2000

### 105-DR FSB

- SDG H0551 – Inorganic & PCB packages: no comment, OK  
Radiochemistry package: Pages 3 & 4 (Detection Levels) – comment regarding missed DL requirement for Cs-137 in sample B0WCJ8 not appropriate, laboratory reported detected for this isotope.
- SDG H0542 – Inorganic & PCB packages: no comment, OK  
Radiochemistry package: Page 2 (Laboratory Blanks, 2<sup>nd</sup> paragraph); Incorrect isotopes (“uranium”-152, “uranium”-154, “uranium”-155) identified, probably should be Europium isotopes.
- SDG H0538 – Inorganic & n PCB packages: no comment, OK  
Radiochemistry package: Page 2 (Laboratory Blanks, 2<sup>nd</sup> paragraph); Delete this section, this project has no PQL for U-238 by GEA.
- SDG H0483 – Inorganic & radiochemistry packages: no comment, OK  
PCB package: additional information requested from laboratory for surrogate results for B0V3Y6. If data available, revision of package will be requested.
- SDG H0472 Inorganic, PCB, & Radiochemistry packages: no comments, OK

### 100-D AREAS

- SDG H0514 – Inorganic package: no comment, OK
- SDG H0505 – Inorganic package: no comment, OK  
Radiochemistry package: Page 3 & 4: Detection Levels; missed TDLs for U-238, U-235 for samples B0W653, B0W654, B0W657 should be identified as “(GEA)”.
- SDG H0490 – Radiochemistry package: no comment, OK
- SDG H0553 – Inorganic & Radiochemistry packages: no comment, OK
- SDG H0533 – Inorganic & Radiochemistry packages: no comment, OK  
PCB package: additional information requested from laboratory for surrogate results for B0WBX6. If data available, revision of package will be requested.