

**CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA**

AMEC Earth & Environmental  
355 South Teller Street  
Suite 300  
Lakewood, CO 80226

Package ID T713RA1

Task Order 313150010

SDG No. IOJ0052

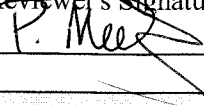
No. of Analyses 14

Laboratory Eberline Services

Reviewer P. Meeks

Analysis/Method Radionuclides

Date: 11/14/05

Reviewer's Signature  


**ACTION ITEMS<sup>a</sup>**

1. **Case Narrative  
Deficiencies**

2. **Out of Scope  
Analyses**

3. **Analyses Not  
Conducted**

4. **Missing Hardcopy  
Deliverables**

5. **Incorrect Hardcopy  
Deliverables**

6. **Deviations from  
Analysis Protocol, e.g.,**

Qualifications were applied as a calibration standard was determined not to be  
NIST traceable.

Holding Times

GC/MS Tune/Inst.

Performance

Calibrations

Blanks

Surrogates

Matrix Spike/Dup LCS

Field QC

Internal Standard

Performance

Compound Identification

and Quantitation

System Performance

**COMMENTS<sup>b</sup>**

<sup>a</sup> Subcontracted analytical laboratory is not meeting contract and/or method requirements.

<sup>b</sup> Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

## Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

### Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
\$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
*#	Unusual problems found with the data that have been described in Section 1, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found.	Unusual problems found with the data that have been described in Section 1, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found.



# DATA VALIDATION REPORT

## Topanga Fire Sampling

ANALYSIS: RADIONUCLIDES

SAMPLE DELIVERY GROUPS: IOJ0052

Prepared by

AMEC—Denver Operations  
355 South Teller Street, Suite 300  
Lakewood, Colorado 80226

## 1. INTRODUCTION

Task Order Title: Topanga Fire Sampling  
Contract Task Order #: 313150010  
SDG#: IOJ0052  
Project Manager: P. Costa  
Matrix: Ash  
Analysis: Radionuclides  
QC Level: Level IV  
No. of Samples: 14  
No. of Reanalyses/Dilutions: 0  
Reviewer: H. Chang  
Date of Review: October 31, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *EPA Prescribed Procedures for Measurements of Radioactivity in Drinking Water, Methods 901.1*, and validation procedures outlined in the *USEPA CLP National Functional Guidelines for Inorganic Data Review (2/94)*. Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

**Table 1. Sample identification**

Client ID	Del Mar ID	Eberline ID	Matrix	COC Method
Perimeter Pond Dam	IOJ0052-01	8613-001	solid	EML HASL, EPA 00-07, 901.1
Happy Valley Near Hydrant 125	IOJ0052-02	8613-002	solid	EML HASL, EPA 00-07, 901.1
Behind B-203	IOJ0052-03	8613-003	solid	EML HASL, EPA 00-07, 901.1
Near SRE Outfall	IOJ0052-04	8613-004	solid	EML HASL, EPA 00-07, 901.1
Above Telescope A-4	IOJ0052-05	8613-005	solid	EML HASL, EPA 00-07, 901.1
Near Well-9 Upper Gate	IOJ0052-06	8613-006	solid	EML HASL, EPA 00-07, 901.1
Old Conservation Yard	IOJ0052-07	8613-007	solid	EML HASL, EPA 00-07, 901.1
Backside SRE	IOJ0052-08	8613-008	solid	EML HASL, EPA 00-07, 901.1
B-064	IOJ0052-09	8613-009	solid	EML HASL, EPA 00-07, 901.1
L-85	IOJ0052-10	8613-010	solid	EML HASL, EPA 00-07, 901.1
RMHF Slope	IOJ0052-11	8613-011	solid	EML HASL, EPA 00-07, 901.1
B-023	IOJ0052-12	8613-012	solid	EML HASL, EPA 00-07, 901.1
B-020	IOJ0052-13	8613-013	solid	EML HASL, EPA 00-07, 901.1
B-886	IOJ0052-14	8613-014	solid	EML HASL, EPA 00-07, 901.1

## 2. DATA VALIDATION FINDINGS

### 2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

#### 2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of  $4\pm 2^{\circ}\text{C}$ . No temperature information was provided by Eberline, the subcontract laboratory; however, as it is not necessary to chill radiological samples, no qualifications were required. The samples were noted to have been received intact and in good condition.

#### 2.1.2 Chain of Custody

The original and the transfer COCs were signed and dated by field and laboratory personnel. Eberline did not list the MWH IDs on the Form Is; therefore, the reviewer edited the Form Is to reflect these IDs. No qualifications were required.

#### 2.1.3 Holding Times

All analyses were performed within 180 days of collection. No qualifications were necessary.

### 2.2 CALIBRATION

The laboratory calibration information included the standard certificates and applicable preparation/dilutions logs for NIST-traceability. Problems with a thorium calibration standard were noted by the laboratory when a lower than expected value was obtained during verification against a NIST-traceable standard. The laboratory sent the standard to the manufacturer for verification; however, the manufacturer claimed the standard could not be verified due to improper dilution. The laboratory then verified the thorium standard against an expired NIST-traceable standard, with acceptable results. The laboratory also purchased a verification standard from a different manufacturer; however, due to dilutions performed by the laboratory, the value of the verification standard is not considered NIST-traceable. Hence, the thorium calibration standard used for measurement of the samples in this SDG is not considered NIST-traceable; therefore, all thorium isotopes were qualified as estimated, "J," for detects or, "UJ," for nondetects.

The thorium, uranium, and strontium chemical yields were all acceptable, with recoveries within 20-105%. The reviewer confirmed that the appropriate peaks were used to quantitate the cesium, cobalt, and europium isotopes. No further qualifications were necessary.

### 2.3 BLANKS

No measurable activities were detected in the method blanks; therefore, no qualifications were necessary.

## **2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES**

One solid LCS was analyzed in association with the samples in this SDG. The recoveries were within the 3-sigma limits. No qualifications were necessary.

## **2.5 LABORATORY DUPLICATES**

The laboratory performed duplicate analyses on sample STP Sampling (IOJ0052-08) for all analytes. All results were within the 3-sigma limits. No qualifications were necessary.

## **2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE**

No matrix spike analyses were performed in association with the samples in this SDG; therefore, no assessment was made with respect to this criterion.

## **2.7 SAMPLE RESULT VERIFICATION**

An EPA Level IV review was performed for the samples in this data package. Sample results and MDAs reported on the sample result forms were verified against the raw data and no calculation or transcription errors were noted. No qualifications were necessary.

## **2.8 FIELD QC SAMPLES**

Field QC samples were evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

### **2.8.1 Field Blanks and Equipment Rinsates**

The samples in this SDG had no associated field QC samples. No qualifications were required.

### **2.8.2 Field Duplicates**

There were no field duplicate samples in this SDG.



# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP 8613

8613-001

IOJ0052-01

## DATA SHEET

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-01</u>	Client sample id <u>IOJ0052-01</u>	
Dept sample id <u>8613-001</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 11:01 464.1 g</u>	
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.040	0.18	0.41		U	SR	u	
Thorium 228	14274-82-9	1.29	0.58	0.43			TH	J	
Thorium 230	14269-63-7	0.112	0.22	0.43		U	TH	uJ	
Thorium 232	7440-29-1	1.06	0.46	0.43			TH	J	
Uranium 233/234	11-08-5	0.824	0.32	0.20			U		
Uranium 235	15117-96-1	0	0.062	0.24		U	U	u	
Uranium 238	7440-61-1	0.644	0.26	0.20			U		
Plutonium 238	13981-16-3	0.003	0.020	0.037		U	PU	u	
Plutonium 239/240	10-12-8	0.007	0.013	0.025		U	PU	u	
Cobalt 60	10198-40-0	U		0.20		U	GAM	u	
Cesium 137	10045-97-3	U		0.19		U	GAM	u	
Europium 152	14683-23-9	U		0.53		U	GAM	u	
Europium 154	15585-10-1	U		0.68		U	GAM	u	

**AMEC VALIDATED**

**LEVEL IV**

Lab id <u>EBRLNE</u>
Protocol <u>Delmar</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/13/05</u>

**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-002

IOJ0052-02

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-02</u>	Client sample id <u>IOJ0052-02</u>	
Dept sample id <u>8613-002</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 11:34</u> <u>220.5 g</u>	
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.171	0.24	0.49		U	SR	U	
Thorium 228	14274-82-9	0.877	0.51	0.48			TH	U	R
Thorium 230	14269-63-7	0.438	0.38	0.48		U	TH	U	
Thorium 232	7440-29-1	1.06	0.51	0.48			TH	U	
Uranium 233/234	11-08-5	1.06	0.36	0.22			U	U	
Uranium 235	15117-96-1	0	0.071	0.27		U	U	U	
Uranium 238	7440-61-1	0.939	0.36	0.22			U	U	
Plutonium 238	13981-16-3	0.030	0.034	0.047		U	PU	U	
Plutonium 239/240	10-12-8	0.008	0.017	0.032		U	PU	U	
Cobalt 60	10198-40-0	U		0.20		U	GAM		
Cesium 137	10045-97-3	U		0.14		U	GAM		
Europium 152	14683-23-9	U		0.49		U	GAM		
Europium 154	15585-10-1	U		0.63		U	GAM		

**AMEC VALIDATED**

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Report date <u>10/13/05</u>

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP 8613

8613-003

IOJ0052-03

## DATA SHEET

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	<u>IOJ0052</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-03</u>	Client sample id <u>IOJ0052-03</u>	
Dept sample id <u>8613-003</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 13:00</u>	<u>566.6 g</u>
	Chain of custody id <u>IOJ0052</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.093	0.23	0.50		U	SR	U	
Thorium 228	14274-82-9	0.871	0.44	0.42			TH	U	R
Thorium 230	14269-63-7	0.925	0.55	0.42			TH	↓	↓
Thorium 232	7440-29-1	1.20	0.56	0.42			TH		
Uranium 233/234	11-08-5	0.622	0.29	0.22			U		
Uranium 235	15117-96-1	0.068	0.069	0.26		U	U	U	
Uranium 238	7440-61-1	0.707	0.29	0.22			U		
Plutonium 238	13981-16-3	0.005	0.030	0.055		U	PU	U	
Plutonium 239/240	10-12-8	0	0.020	0.048		U	PU	↓	
Cobalt 60	10198-40-0	U		0.19		U	GAM	↓	
Cesium 137	10045-97-3	0.289	0.15	0.13			GAM		
Europium 152	14683-23-9	U		0.48		U	GAM	U	
Europium 154	15585-10-1	U		0.64		U	GAM	U	

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Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/13/05</u>

**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-004

IOJ0052-04

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-04</u>	Client sample id <u>IOJ0052-04</u>	
Dept sample id <u>8613-004</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 13:04 344.1 g</u>	
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.292	0.24	0.43		U	SR	U	
Thorium 228	14274-82-9	1.11	0.48	0.45			TH	J	R
Thorium 230	14269-63-7	0.874	0.48	0.45			TH	↓	↓
Thorium 232	7440-29-1	1.17	0.48	0.45			TH		
Uranium 233/234	11-08-5	0.669	0.28	0.21			U		
Uranium 235	15117-96-1	0.067	0.068	0.26		U	U	U	
Uranium 238	7440-61-1	0.697	0.28	0.21			U		
Plutonium 238	13981-16-3	-0.009	0.009	0.041		U	PU	U	
Plutonium 239/240	10-12-8	0.013	0.017	0.033		U	PU	↓	
Cobalt 60	10198-40-0	U		0.18		U	GAM		
Cesium 137	10045-97-3	U		0.19		U	GAM		
Europium 152	14683-23-9	U		0.36		U	GAM		
Europium 154	15585-10-1	U		0.64		U	GAM	↓	

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**LEVEL IV**

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Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/13/05</u>

**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-005

IOJ0052-05

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-05</u>	Client sample id <u>IOJ0052-05</u>	
Dept sample id <u>8613-005</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 13:30 341.0 g</u>	
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.115	0.19	0.40		U	SR	U	
Thorium 228	14274-82-9	0.359	0.43	0.55		U	TH	UJ	R
Thorium 230	14269-63-7	0.215	0.29	0.55		U	TH	↓	↓
Thorium 232	7440-29-1	0.502	0.43	0.55		U	TH		
Uranium 233/234	11-08-5	0.237	0.16	0.20			U		
Uranium 235	15117-96-1	0.032	0.064	0.24		U	U	U	
Uranium 238	7440-61-1	0.475	0.21	0.20			U		
Plutonium 238	13981-16-3	0	0.044	0.17		U	PU	U	
Plutonium 239/240	10-12-8	0	0.044	0.17		U	PU	↓	
Cobalt 60	10198-40-0	U		0.15		U	GAM		
Cesium 137	10045-97-3	U		0.23		U	GAM		
Europium 152	14683-23-9	U		0.34		U	GAM		
Europium 154	15585-10-1	U		0.52		U	GAM	↓	

**AMEC VALIDATED**  
**LEVEL IV**

DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Delmar</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/13/05</u>

**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-006

IOJ0052-06

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	<u>IOJ0052</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-06</u>	Client sample id <u>IOJ0052-06</u>	
Dept sample id <u>8613-006</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 13:35 342.7 g</u>	
	Chain of custody id <u>IOJ0052</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	-0.071	0.16	0.43		U	SR	U	
Thorium 228	14274-82-9	0.799	0.46	0.44			TH	J	R
Thorium 230	14269-63-7	0.684	0.46	0.44			TH	↓	↓
Thorium 232	7440-29-1	1.14	0.47	0.44			TH		
Uranium 233/234	11-08-5	0.767	0.29	0.22			U		
Uranium 235	15117-96-1	0	0.069	0.26		U	U	U	
Uranium 238	7440-61-1	0.540	0.23	0.22			U		
Plutonium 238	13981-16-3	0	0.087	0.33		U	PU	U	
Plutonium 239/240	10-12-8	0.044	0.087	0.33		U	PU	↓	
Cobalt 60	10198-40-0	U		0.22		U	GAM		
Cesium 137	10045-97-3	U		0.24		U	GAM		
Europium 152	14683-23-9	U		0.64		U	GAM		
Europium 154	15585-10-1	U		0.80		U	GAM	↓	

**AMEC VALIDATED**

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Protocol <u>Delmar</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/13/05</u>

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP 8613

8613-007

IOJ0052-07

## DATA SHEET

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	<u>IOJ0052</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-07</u>	Client sample id <u>IOJ0052-07</u>	
Dept sample id <u>8613-007</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 14:06</u>	<u>321.3 g</u>
	Chain of custody id <u>IOJ0052</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.014	0.19	0.44		U	SR	U	
Thorium 228	14274-82-9	0.983	0.54	0.50			TH	U	R
Thorium 230	14269-63-7	0.131	0.26	0.50		U	TH	U	↓
Thorium 232	7440-29-1	0.720	0.40	0.50			TH	U	
Uranium 233/234	11-08-5	1.04	0.33	0.20			U	U	
Uranium 235	15117-96-1	0.032	0.065	0.25		U	U	U	
Uranium 238	7440-61-1	0.613	0.27	0.20			U	U	
Plutonium 238	13981-16-3	0.038	0.075	0.29		U	PU	U	
Plutonium 239/240	10-12-8	0	0.075	0.29		U	PU	U	
Cobalt 60	10198-40-0	U		0.14		U	GAM	U	
Cesium 137	10045-97-3	U		0.14		U	GAM	U	
Europium 152	14683-23-9	U		0.32		U	GAM	U	
Europium 154	15585-10-1	U		0.45		U	GAM	U	

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**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-008

IOJ0052-08

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>
Lab sample id <u>R510016-08</u>	Client sample id <u>IOJ0052-08</u>
Dept sample id <u>8613-008</u>	Location/Matrix <u>Boeing Site</u> <u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 14:15</u> <u>304.0 g</u>
	Chain of custody id <u>IOJ0052</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	-0.032	0.17	0.43		U	SR	U	
Thorium 228	14274-82-9	0.373	0.30	0.57		U	TH	UJ	R
Thorium 230	14269-63-7	1.04	0.61	0.57			TH	UJ	↓
Thorium 232	7440-29-1	0.223	0.30	0.57		U	TH	UJ	
Uranium 233/234	11-08-5	0.436	0.19	0.18			U		
Uranium 235	15117-96-1	0.056	0.056	0.21		U	U	U	
Uranium 238	7440-61-1	0.413	0.19	0.18			U		
Plutonium 238	13981-16-3	0	0.047	0.18		U	PU	U	
Plutonium 239/240	10-12-8	0	0.047	0.18		U	PU		
Cobalt 60	10198-40-0	U		0.13		U	GAM		
Cesium 137	10045-97-3	U		0.10		U	GAM		
Europium 152	14683-23-9	U		0.29		U	GAM		
Europium 154	15585-10-1	U		0.36		U	GAM		

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LEVEL IV**

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**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-009

IOJ0052-09

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	<u>IOJ0052</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-09</u>	Client sample id <u>IOJ0052-09</u>	
Dept sample id <u>8613-009</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 14:19</u>	<u>555.0 g</u>
	Chain of custody id <u>IOJ0052</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.044	0.17	0.39		U	SR	U	
Thorium 228	14274-82-9	1.03	0.50	0.46			TH	J	R
Thorium 230	14269-63-7	0.967	0.49	0.46			TH	↓	↓
Thorium 232	7440-29-1	1.09	0.50	0.46			TH		
Uranium 233/234	11-08-5	0.490	0.23	0.22			U		
Uranium 235	15117-96-1	0.035	0.070	0.27		U	U	U	
Uranium 238	7440-61-1	0.634	0.29	0.22			U		
Plutonium 238	13981-16-3	0	0.057	0.22		U	PU	U	
Plutonium 239/240	10-12-8	-0.028	0.057	0.22		U	PU	↓	
Cobalt 60	10198-40-0	U		0.22		U	GAM		
Cesium 137	10045-97-3	U		0.19		U	GAM		
Europium 152	14683-23-9	U		0.53		U	GAM		
Europium 154	15585-10-1	U		0.69		U	GAM	↓	

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SAMPLE DELIVERY GROUP 8613

8613-010

IOJ0052-10

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-10</u>	Client sample id <u>IOJ0052-10</u>	
Dept sample id <u>8613-010</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 14:35 224.7 g</u>	
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.331	0.29	0.54		U	SR	U	
Thorium 228	14274-82-9	0.902	0.46	0.43			TH	J	R
Thorium 230	14269-63-7	0.788	0.46	0.43			TH	↓	↓
Thorium 232	7440-29-1	0.957	0.46	0.43			TH		
Uranium 233/234	11-08-5	0.686	0.32	0.24			U		
Uranium 235	15117-96-1	0.038	0.076	0.29		U	U	U	
Uranium 238	7440-61-1	1.03	0.38	0.24			U		
Plutonium 238	13981-16-3	0.025	0.049	0.19		U	PU	U	
Plutonium 239/240	10-12-8	0	0.049	0.19		U	PU	↓	
Cobalt 60	10198-40-0	U		0.20		U	GAM		
Cesium 137	10045-97-3	U		0.21		U	GAM		
Europium 152	14683-23-9	U		0.46		U	GAM		
Europium 154	15585-10-1	U		0.73		U	GAM	↓	

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**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP 8613

8613-011

IOJ0052-11

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-11</u>	Client sample id <u>IOJ0052-11</u>	
Dept sample id <u>8613-011</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 14:52 187.6 g</u>	
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	5.60	0.88	0.46			SR		
Thorium 228	14274-82-9	0.699	0.44	0.41			TH	J	R
Thorium 230	14269-63-7	0.806	0.44	0.41			TH	↓	↓
Thorium 232	7440-29-1	1.13	0.55	0.41			TH		
Uranium 233/234	11-08-5	1.17	0.36	0.22			U		
Uranium 235	15117-96-1	0.035	0.069	0.26		U	U	U	
Uranium 238	7440-61-1	1.14	0.35	0.22			U		
Plutonium 238	13981-16-3	0.027	0.054	0.21		U	PU	U	
Plutonium 239/240	10-12-8	0	0.054	0.21		U	PU	↓	
Cobalt 60	10198-40-0	U		0.19		U	GAM		
Cesium 137	10045-97-3	U		0.24		U	GAM		
Europium 152	14683-23-9	U		0.48		U	GAM		
Europium 154	15585-10-1	U		0.71		U	GAM		

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# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP 8613

8613-012

IOJ0052-12

## DATA SHEET

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	<u>IOJ0052</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-12</u>	Client sample id <u>IOJ0052-12</u>	
Dept sample id <u>8613-012</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 15:15</u>	<u>301.2 g</u>
	Chain of custody id <u>IOJ0052</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	-0.085	0.16	0.43		U	SR	U	
Thorium 228	14274-82-9	0.981	0.47	0.44			TH	J	R
Thorium 230	14269-63-7	0.750	0.47	0.44			TH	↓	↓
Thorium 232	7440-29-1	0.865	0.47	0.44			TH		
Uranium 233/234	11-08-5	0.844	0.31	0.23			U		
Uranium 235	15117-96-1	0	0.073	0.28		U	U	U	
Uranium 238	7440-61-1	0.753	0.31	0.23			U		
Plutonium 238	13981-16-3	0.025	0.051	0.19		U	PU	U	
Plutonium 239/240	10-12-8	0	0.051	0.19		U	PU	↓	
Cobalt 60	10198-40-0	U		0.26		U	GAM		
Cesium 137	10045-97-3	U		0.24		U	GAM		
Europium 152	14683-23-9	U		0.64		U	GAM		
Europium 154	15585-10-1	U		0.91		U	GAM		

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SAMPLE DELIVERY GROUP 8613

8613-013

IOJ0052-13

**DATA SHEET**

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	IOJ0052
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-13</u>	Client sample id <u>IOJ0052-13</u>	
Dept sample id <u>8613-013</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 15:21</u>	<u>40.1 g</u>
Chain of custody id <u>IOJ0052</u>		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	0.142	0.20	0.40		U	SR	U	
Thorium 228	14274-82-9	0.444	0.38	0.49		U	TH	U	R
Thorium 230	14269-63-7	0.380	0.38	0.48		U	TH	↓	↓
Thorium 232	7440-29-1	0.443	0.38	0.48		U	TH	↓	
Uranium 233/234	11-08-5	0.345	0.23	0.44		U	U	U	
Uranium 235	15117-96-1	0.070	0.14	0.53		U	U	↓	
Uranium 238	7440-61-1	0.230	0.23	0.44		U	U		
Plutonium 238	13981-16-3	0.045	0.091	0.35		U	PU		
Plutonium 239/240	10-12-8	0	0.091	0.35		U	PU		
Cobalt 60	10198-40-0	U		0.65		U	GAM		
Cesium 137	10045-97-3	U		0.58		U	GAM		
Europium 152	14683-23-9	U		1.7		U	GAM		
Europium 154	15585-10-1	U		2.1		U	GAM		

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# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP 8613

8613-014

IOJ0052-14

## DATA SHEET

SDG <u>8613</u>	Client/Case no <u>De Mar Analytical</u>	<u>IOJ0052</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>IOJ0052</u>	
Lab sample id <u>R510016-14</u>	Client sample id <u>IOJ0052-14</u>	
Dept sample id <u>8613-014</u>	Location/Matrix <u>Boeing Site</u>	<u>SOLID</u>
Received <u>10/05/05</u>	Collected/Weight <u>10/03/05 15:30</u>	<u>86.2 g</u>
	Chain of custody id <u>IOJ0052</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	Rev Qual	Qual Code
Strontium 90	10098-97-2	-0.015	0.21	0.50		U	SR	U	
Thorium 228	14274-82-9	1.34	0.60	0.45			TH	J	R
Thorium 230	14269-63-7	0.641	0.47	0.45			TH	↓	↓
Thorium 232	7440-29-1	0.758	0.47	0.45			TH		
Uranium 233/234	11-08-5	0.592	0.27	0.21			U		
Uranium 235	15117-96-1	0	0.065	0.25		U	U	U	
Uranium 238	7440-61-1	0.780	0.28	0.21			U		
Plutonium 238	13981-16-3	0.025	0.051	0.19		U	PU	U	
Plutonium 239/240	10-12-8	0	0.051	0.19		U	PU		
Cobalt 60	10198-40-0	U		0.36		U	GAM		
Cesium 137	10045-97-3	U		0.34		U	GAM		
Europium 152	14683-23-9	U		0.93		U	GAM		
Europium 154	15585-10-1	U		1.1		U	GAM		

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