BOOBN4-SAI

0046169

Science Applications International Corporation
An Employee-Owned Company

December 5, 1990

JAN 1997
RECEIVED
LDMC

Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352
Attn: R. A. Bechtold

Reference: Contract No. MPB-SVV-069146

Dear Ms. Bechtold:

Enclosed is the sample delivery group No. *BOOBN4* and SOW No. *300-FF-1 Remedial Investigation, Task 5b Vegetation Analysis for CY 1990*. The following samples were received on October 19, 1990:

WHC Sample No.	*SAIC Sample No.*
BOOBN4	19729
BOOBN5	19730
BOOBP2	19742
BOOBP3	19732
BOOBM9	19733
BOOBN0	19734
BOOBM6	19735
BOOBM7	19736
BOOBM8	19737
BOOBN3	19738
BOOBN2	19739
BOOBN1	19740

3 Choke Cherry Road, Rockville, Maryland 20850 (301) 977-4480
Other SAIC Offices: Albuquerque, Boston, Colorado Springs, Dayton, Huntsville, Las Vegas, Los Angeles, McLean, Oak Ridge, Orlando, Palo Alto, San Diego, Seattle, Tucson

Data is also included for the blanks, replicates, spikes, and lab control samples. Samples were as follows:

Type of Sample	*SAIC Sample Numbers*
Duplicate	19731
Duplicate	19741

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

Very truly yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

for

Farideh Moghadami
Laboratory Manager

cc: QA Officer

SAIC
Analytical Laboratory
3 Choke Cherry Road
Rockville, MD 20850-4087

CASE NARRATIVE

Sample Delivery Group No. BOOBN4 was analyzed in accordance with SAIC's standard operating procedures and the quality assurance program. This group was received on October 19, 1990 and included the following samples:

WHC Sample No.	*SAIC Sample No.*	*Sample Date*	*Sample Type*
BOOBN4	19729	05/14/90	Asparagus
BOOBN5	19730	05/14/90	Asparagus
BOOBP2	19742	06/19/90	Asparagus
BOOBP3	19732	06/19/90	Asparagus
BOOBM9	19733	04/25/90	Asparagus
BOOBN0	19734	04/25/90	Asparagus
BOOBM6	19735	05/11/90	Asparagus
BOOBM7	19736	05/11/90	Asparagus
BOOBM8	19737	05/11/90	Asparagus
BOOBN3	19738	05/14/90	Asparagus
BOOBN2	19739	05/14/90	Asparagus
BOOBN1	19740	05/14/90	Asparagus

No abnormalities, problems, or deviations from accepted procedures were identified except those noted as follows:

Issue	*Reason*
Short half-life nuclides	All samples are decay-corrected to the reference date of that sample. Nuclides ^{99m}Mo/Tc, ^{133}Xe, ^{131m}Xe, ^{131}I, ^{136}Cs, ^{140}Ba/La have very short half lives. The reported MDL values for these nuclides appear high due to the decay correction factor and should not be used in any calculations

SAIC
Analytical Laboratory
3 Choke Cherry Road
Rockville, MD 20850-4087

Issue	*Reason*
Reported values higher than 1 pCi/g for ^{137}Cs and ^{60}Co	SAIC Sample Numbers:

19739	^{137}Cs	Value	1.3E-06	μCi
19742	^{137}Cs	Value	1.6E-06	μCi
19729	^{137}Cs	Value	1.1E-06	μCi
19738	^{137}Cs	Value	1.1E-06	μCi
19734	^{137}Cs	Value	1.1E-06	μCi
19729	^{60}Co	Value	1.2E-06	μCi
19732	^{60}Co	Value	1.1E-06	μCi
19741	^{60}Co	Value	1.1E-06	μCi

All samples were counted for 50,000 seconds (13 hours). The detection limit for ^{60}Co was 1.2, 1.1, and 1.1 picocuries per gram for samples 19729, 19732, and 19741 respectively. The detection limit for ^{137}Cs on samples 19729, 19738, 19734 was 1.1 picocuries per gram. Samples 19739 and 19742 had real ^{137}Cs values of 6.57E-07 μCi $\pm$ 50% and 9.41E-07 μCi $\pm$ 38%. These uncertainties are 1 sigma error. When calculated at 2 sigma error, the uncertainty is greater than 67%. The 67% represents the 95% confidence level for analytical results. The minimum detectable limits are determined by adding the uncertainty to the calculated value.

Issue	*Reason*
Alpha-emitter nuclides reported on the gamma report	Nuclides ^{226}Ra, ^{228}Ra, ^{228}Th, ^{235}U, ^{238}U, and ^{241}Am appear on the gamma spectrum. Better detection limits are possible by alpha spectroscopy.
Sample 19734 EU-152 peak (reported as a MDL)	The gamma scan detected a peak for this sample at the 344 KeV energy level. The software analysis identified it as EU-152. However the 344 peak is secondary for EU-152. A peak of higher intensity would have been detected at the 122 KeV energy if the EU-152 were present. Without further investigation we feel the peak at the 344 KeV energy level suggests the presence of Bismuth 210.

Westinghouse Hanford Company

Westinghouse Hanford Company
A subsidiary of Westinghouse Electric Corporation
P.O. Box 1970 Richland, Wa 99352

RELEASE TO SHIP

41440

MO	DAY	YR
10	12	90

DATE SHIPPED: MO | DAY | YR

VENDOR CODE: 55922

PURCHASE ORDER REF: MPB-SYV-069146

SHIP TO
SCIENCE APPLICATIONS INTERNATIONAL CORP.
LABORATORY SERVICES DIVISION
3 CHOKE CHERRY ROAD
ROCKVILLE MD 20850-4087
ATTN: RADWASTE SAMPLE COORDINATOR
RMA NO.

FOR ACCOUNT OF
WESTINGHOUSE HANFORD COMPANY
PO BOX 1970
RICHLAND WA 99352

F.O.B.	CAR INITIALS AND NO.	FRT. CHGS. 1. VENDOR 2. WESTINGHOUSE HANFORD	BUYER CODE	BUYER NAME	PHONE
ROCKVILLE MD		2	PB	P. D. BRAUN	6-5762

B/L	B/L WEIGHT	ROUTING	RETURN DUE DATE	REQUISITION NO.
		AIRBORNE OR ~~FEDERAL EXPRESS~~	TBD	069146

P/O ITEM	QUANTITY	U M	DESCRIPTION	AMOUNT
	5	EA	BOXES ~~COOLERS~~ OF VEGETATION SAMPLES	

3/8/90

REDISTRIBUTE COST ☐ YES ☒ NO | SPECIAL PACKAGING REQUIRED ☐ YES ☒ NO

REASON FOR SHIPMENT: F

A. RETURN FOR CREDIT
B. RETURN FOR REPLACEMENT
C. RETURN FOR REPAIR
D. RETURN VENDOR-OWNED RETURNABLE CONTAINER
E. RETURN OVERSHIPMENTS
F. RETURN SAMPLE
G. RETURN VENDOR-OWNED MATERIAL OR EQUIPMENT
H. SHIP GOVERNMENT -OWNED TOOLS, JIGS, AND FIXTURES
I. SHIP EXCHANGE UNITS (CORE)
J. SHIP MATERIAL OR EQUIPMENT FOR REPAIR OR REBUILD
K. SHIP MATERIAL OR EQUIPMENT FOR REPAIR ESTIMATE
L. SHIP GOVERNMENT -OWNED RETURNABLE CONTAINER
M. SHIP GOVERNMENT-OWNED MATERIAL FOR USE IN FABRICATION
N. MISCELLANEOUS-

HAZARDOUS MATERIAL ☐ YES ☒ NO IF YES, HAZARDOUS MATERIAL FORM IS REQUIRED TO ACCOMPANY MATERIAL.

LOCATION OF MATERIAL	TOTAL PIECES	RM CLEARANCE FOR PUBLIC SALE	SURVEY NO.
TO BE DELIVERED TO SHIPPING	5		DATE

CUSTODIAN: R. A. BECHTOLD | PHONE: 3-3448 | DATE AVAILABLE FOR SHIPMENT: 10-16-90

ITEM	CO ID*	COST CENTER	MC	COST ELEMENT	CHARGE CODE	% OF COST
	W	16500		210	EC32Y	100

AUTHORIZED BY: P. D. BRAUN — DATE 10-12-90

FOR DOE — DATE

FOR SHIPPING OPERATION — DATE

1-ACCOUNTS PAYABLE COPY
3-PROPERTY MANAGEMENT COPY
5-PACKING LIST COPY
7-CUSTODIAN COPY-2
2-BUYER'S COPY
4-SHIPPING COPY
6-CUSTODIAN COPY 1
8-PURCHASING COPY

5

5-1

54-7000-169 (12 8

Battelle
Pacific Northwest Laboratories
Richland, Washington

CHAIN OF CUSTODY

CAB 036

Company Contact: C.A. BRANDT Telephone: 376-5345

Samples Collected by: NA Date: Time:

Sample Location: NA

Ice Chest No.: NA Field Logbook Page No.:

Remarks: ~~99Tc~~ 90 splits for Gamma Scan
NC 10/16/90

Method of Shipment: Hand Carry

Sample Identification

New Number	Parent Number
X B00BN4	B009C2
X B00BN5	B009C3
X B00BP2	B00BK6
X B00BP3	B00BK7
X B00BM9	ASPG035
X B00BN0	ASPG036
X B00BM6	B00993
X B00BM7	B00994
X B00BM8	B00995
X B00BN3	B009C1
X B00BN2	B009C0

New Number	Parent Number
X B00BN1	B009B9

Chain of Possession

Relinquished by:	Received by:	Date/Time:
RJ Fellows	Gordon Blackett	10/17/90 11:00 AM
Relinquished by:	Received by:	Date/Time:
	L Rieke SAIC	10/18/90 - 1030
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

PNL-MA-567, GC-1

BC-1200-345 (11/89)

Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19729
Plant Sample ID	:	BOOBN4
Volume/Weight	:	1.0149E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<1.6E-05	141-Ce			<7.0E-06
40-K	2.09E-05	40		144-Ce/Pr			<1.3E-06
51-Cr			<7.6E-05	152-Eu			<4.6E-07
54-Mn			<4.2E-07	154-Eu			<7.8E-07
57-Co			<1.8E-07	155-Eu			<4.6E-07
58-Co			<1.5E-06	203-Hg			<1.5E-06
59-Fe			<7.6E-06	226-Ra			<7.4E-07
60-Co			<1.2E-06	228-Ra			<1.4E-06
65-Zn			<9.5E-07	228-Th			<3.1E-06
75-Se			<4.8E-07	235-U			<2.0E-07
85-Kr			<5.2E-05	238-U			<3.6E-05
85-Sr			<1.3E-06	241-Am			<5.7E-07
88-Y			<9.4E-07				
94-Nb			<2.7E-07				
95-Nb			<7.6E-06				
95-Zr			<3.0E-06				
99m-Mo/Tc			<3.1E+11				
103-Ru			<4.5E-06				
106-Ru/Rh			<2.9E-06				
108m-Ag			<2.0E-07				
109-Cd			<4.0E-06				
110m-Ag			<5.9E-07				
113-Sn			<8.5E-07				
124-Sb			<1.6E-06				
125-Sb			<7.6E-07				
127-Xe			<3.5E-06				
131-I			<2.9E-01				
131m-Xe			<1.0E-01				
133-Xe			<1.5E+03				
133-Ba			<1.8E-07				
134-Cs			<3.9E-07				
136-Cs			<2.0E-03				
137-Cs			<1.1E-06				
139-Ce			<2.7E-07				
140-Ba/La			<4.3E-03				

Project Manager _____

Laboratory Manager _____

The data contained in this report were produced and documented in accordance with approved quality control and quality assurance procedures. All of the results are decay corrected to the reference date listed above. Indicated errors are two (2) standard deviations based on counting statistics only.

Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19730
Plant Sample ID	:	BOOBN5
Volume/Weight	:	1.0360E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(pCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<3.1E-05	141-Ce			<1.3E-05
40-K	1.91E-05	63		144-Ce/Pr			<1.6E-06
51-Cr			<1.5E-04	152-Eu			<4.3E-07
54-Mn			<5.0E-07	154-Eu			<9.9E-07
57-Co			<2.2E-07	155-Eu			<6.0E-07
58-Co			<2.1E-06	203-Hg			<2.6E-06
59-Fe			<1.4E-05	226-Ra			<1.5E-06
60-Co	1.21E-06	34		228-Ra			<1.7E-06
65-Zn			<1.2E-06	228-Th			<3.0E-06
75-Se			<6.2E-07	235-U			<5.9E-07
85-Kr			<6.9E-05	238-U			<4.0E-05
85-Sr			<2.3E-06	241-Am			<1.3E-06
88-Y			<1.3E-06				
94-Nb			<3.3E-07				
95-Nb			<1.4E-05				
95-Zr			<4.1E-06				
99m-Mo/Tc			<1.7E+14				
103-Ru			<8.7E-06				
106-Ru/Rh			<3.9E-06				
108m-Ag			<1.5E-07				
109-Cd			<5.9E-06				
110m-Ag			<8.1E-07				
113-Sn			<6.7E-07				
124-Sb			<2.5E-06				
125-Sb			<5.5E-07				
127-Xe			<6.2E-06				
131-I			<2.8E+00				
131m-Xe			<4.7E-01				
133-Xe			<6.0E+04				
133-Ba			<2.1E-07				
134-Cs			<5.1E-07				
136-Cs			<8.7E-03				
137-Cs			<6.1E-07				
139-Ce			<3.6E-07				
140-Ba/La			<2.2E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19731
Plant Sample ID	:	DUPLICATE BOOBN5
Volume/Weight	:	1.0360E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.3E-05	144-Ce/Pr			<1.4E-06
40-K	1.41E-07	62		152-Eu			<4.4E-07
51-Cr			<1.3E-04	154-Eu			<7.7E-07
54-Mn			<4.2E-07	155-Eu			<4.4E-07
57-Co			<2.0E-07	203-Hg			<2.3E-06
58-Co			<1.9E-06	226-Ra			<5.5E-06
59-Fe			<1.1E-05	228-Ra			<4.0E-06
60-Co	7.16E-07	10		228-Th			<2.8E-06
65-Zn			<9.6E-07	235-U			<7.1E-07
75-Se			<5.6E-07	238-U			<3.0E-05
85-Kr			<5.2E-05	241-Am			<5.6E-07
85-Sr			<1.7E-06				
88-Y			<1.2E-06				
94-Nb			<2.6E-07				
95-Nb			<1.1E-05				
95-Zr			<3.8E-06				
99m-Mo/Tc			<2.1E+14				
103-Ru			<7.2E-06				
106-Ru/Rh			<3.4E-06				
108m-Ag			<2.2E-07				
109-Cd			<4.2E-06				
110m-Ag			<7.1E-07				
113-Sn			<9.4E-07				
124-Sb			<2.2E-06				
125-Sb			<7.6E-07				
127-Xe			<5.5E-06				
131-I			<2.4E+00				
131m-Xe			<4.7E-01				
133-Xe			<4.8E+04				
133-Ba			<2.0E-07				
134-Cs			<4.1E-07				
136-Cs			<8.1E-03				
137-CS			<9.7E-07				
139-Ce			<3.1E-07				
140-Ba/La			<1.8E-02				
141-Ce			<1.3E-05				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	06/19/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19732
Plant Sample ID	:	BOOBP3
Volume/Weight	:	1.0045E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<9.5E-07				
58-Co			<1.5E-06	228-Ra			<3.1E-06
59-Fe			<5.8E-06	228-Th			<3.4E-06
60-Co			<1.1E-06	235-U			<2.3E-07
65-Zn			<1.2E-06	238-U			<4.7E-05
75-Se			<4.5E-07	241-Am			<1.4E-06
85-Kr			<1.2E-06				
85-Sr			<8.2E-07				
88-Y			<3.3E-07				
94-Nb			<3.3E-07				
95-Nb			<5.3E-06				
95-Zr			<2.8E-06				
99m-Mo/Tc			<5.0E+07				
103-Ru			<3.5E-06				
106-Ru/Rh			<3.9E-06				
108m-Ag			<2.9E-07				
109-Cd			<5.4E-06				
110m-Ag			<7.2E-07				
113-Sn			<5.5E-07				
124-Sb			<1.5E-06				
125-Sb			<9.5E-07				
127-Xe			<2.0E-06				
131-I			<1.7E-02				
133m-Xe			<1.5E-02				
133-Xe			<2.5E+01				
133-Ba			<2.3E-07				
134-Cs			<5.5E-07				
136-Cs			<3.8E-04				
137-Cs			<6.8E-07				
139-Ce			<2.7E-07				
140-Ba/La			<8.9E-04				
141-Ce			<3.8E-06				
144-Ce/Pr			<1.5E-06				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	04/25/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19733
Plant Sample ID	:	BOOBM9
Volume/Weight	:	1.0323E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.4E-05	141-Ce			<1.1E-05
40-K	3.12E-05	29		144-Ce/Pr			<1.5E-06
51-Cr			<1.1E-04	152-Eu			<4.5E-07
54-Mn			<4.4E-07	154-Eu			<7.1E-07
57-Co			<1.9E-07	155-Eu			<4.7E-07
58-Co			<1.8E-06	203-Hg			<2.2E-06
59-Fe			<1.1E-05	226-Ra			<7.6E-07
60-Co	1.01E-06	26		228-Ra			<1.6E-06
65-Zn			<1.1E-06	228-Th			<3.4E-06
75-Se			<4.9E-07	235-U			<1.9E-07
85-Kr			<4.9E-05	238-U			<3.2E-05
85-Sr			<1.6E-06	241-Am			<5.6E-07
88-Y			<1.2E-06				
94-Nb			<2.7E-07				
95-Nb			<1.2E-05				
95-Zr			<4.1E-06				
99m-Mo/Tc			<7.5E+13				
103-Ru			<6.7E-06				
106-Ru/Rh			<3.2E-06				
108m-Ag			<2.3E-07				
109-Cd			<4.1E-06				
110m-Ag			<6.2E-07				
113-Sn			<9.8E-07				
124-Sb			<2.0E-06				
125-Sb			<7.3E-07				
127-Xe			<5.3E-06				
131-I			<1.8E+00				
131m-Xe			<3.7E-01				
133-Xe			<2.8E+04				
133-Ba			<1.8E-07				
134-Cs			<3.5E-07				
136-Cs			<6.9E-03				
137-Cs			<8.7E-07				
139-Ce			<3.2E-07				
140-Ba/La			<1.5E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	04/25/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19734
Plant Sample ID	:	BOOBN0
Volume/Weight	:	1.0222E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<3.2E-05	141-Ce			<1.3E-05
40-K	3.63E-05	34		144-Ce/Pr			<1.7E-06
51-Cr			<1.5E-04	152-Eu			<8.0E-06
54-Mn			<6.4E-07	154-Eu			<1.1E-06
57-Co			<2.3E-07	155-Eu			<5.9E-07
58-Co			<2.5E-06	203-Hg			<2.5E-06
59-Fe			<1.5E-05	226-Ra			<8.7E-07
60-Co	3.36E-06	10		228-Ra			<2.0E-06
65-Zn			<1.4E-06	228-Th	3.39E-07	10	
75-Se			<6.3E-07	235-U			<2.2E-07
85-Kr			<7.9E-05	238-U			<4.6E-05
85-Sr			<2.5E-06	241-Am			<1.5E-06
88-Y			<1.5E-06				
94-Nb			<3.8E-07				
95-Nb			<1.5E-05				
95-Zr			<5.2E-06				
99m-Mo/Tc			<1.1E+14				
103-Ru			<1.0E-05				
106-Ru/Rh			<4.7E-06				
108m-Ag			<1.7E-07				
109-Cd			<5.8E-06				
110m-Ag			<8.7E-07				
113-Sn			<6.5E-07				
124-Sb			<2.7E-06				
125-Sb			<4.9E-07				
127-Xe			<6.4E-06				
131-I			<2.6E+00				
131m-Xe			<4.4E-01				
133-Xe			<4.9E+04				
133-Ba			<2.3E-07				
134-Cs			<5.2E-07				
136-Cs			<9.9E-03				
137-Cs			<1.1E-06				
139-Ce			<3.5E-07				
140-Ba/La			<2.3E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/11/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19735
Plant Sample ID	:	BOOBM6
Volume/Weight	:	1.0139E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<1.6E-05	141-Ce			<1.1E-05
40-K	9.68E-05	10		144-Ce/Pr			<1.7E-06
51-Cr			<1.1E-04	152-Eu			<4.9E-07
54-Mn			<4.7E-07	154-Eu			<9.2E-07
57-Co			<2.3E-07	155-Eu			<6.3E-07
58-Co			<1.9E-06	203-Hg			<2.2E-06
59-Fe			<1.1E-05	226-Ra			<8.6E-07
60-Co	1.48E-06	10		228-Ra			<1.9E-06
65-Zn			<1.3E-06	228-Th			<4.1E-06
75-Se			<5.6E-07	235-U	6.26E-07	56	
85-Kr			<7.4E-05	238-U			<4.4E-05
85-Sr			<2.1E-06	241-Am			<1.4E-06
88-Y			<1.2E-06				
94-Nb			<3.3E-07				
95-Nb			<1.1E-05				
95-Zr			<4.0E-06				
99m-Mo/Tc			<4.6E+12				
103-Ru			<7.4E-06				
106-Ru/Rh			<4.4E-06				
108m-Ag			<1.7E-07				
109-Cd			<6.0E-06				
110m-Ag			<8.2E-07				
113-Sn			<7.1E-07				
124-Sb			<2.2E-06				
125-Sb			<5.4E-07				
127-Xe			<4.8E-06				
131-I			<7.6E-01				
131m-Xe			<2.2E-01				
133-Xe			<9.3E+03				
133-Ba			<2.2E-07				
134-Cs			<5.2E-07				
136-Cs			<4.3E-03				
137-Cs	9.14E-07	65					
139-Ce			<3.3E-07				
140-Ba/La			<5.5E-03				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/11/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19736
Plant Sample ID	:	BOOBM7
Volume/Weight	:	1.0777E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.0E-05	141-Ce			<9.7E-06
40-K	3.59E-05	24		144-Ce/Pr			<1.4E-06
51-Cr			<9.6E-05	152-Eu			<4.7E-07
54-Mn			<4.3E-07	154-Eu			<7.4E-07
57-Co			<2.0E-07	155-Eu			<4.8E-07
58-Co			<1.6E-06	203-Hg			<1.9E-06
59-Fe			<8.5E-06	226-Ra			<7.0E-07
60-Co	7.31E-07	20		228-Ra			<1.5E-06
65-Zn			<1.0E-06	228-Th			<3.2E-06
75-Se			<5.3E-07	235-U			<1.9E-07
85-Kr			<5.4E-05	238-U			<3.7E-05
85-Sr			<1.6E-06	241-Am			<5.9E-07
88-Y			<9.3E-07				
94-Nb			<2.8E-07				
95-Nb			<9.7E-06				
95-Zr			<3.5E-06				
99m-Mo/Tc			<5.3E+12				
103-Ru			<5.1E-06				
106-Ru/Rh			<2.8E-06				
108m-Ag			<2.2E-07				
109-Cd			<4.3E-06				
110m-Ag			<6.3E-07				
113-Sn			<8.7E-07				
124-Sb			<1.7E-06				
125-Sb			<6.6E-07				
127-Xe			<4.4E-06				
131-I			<7.2E-01				
131m-Xe			<1.9E-01				
133-Xe			<7.0E+03				
133-Ba			<1.9E-07				
134-Cs			<3.8E-07				
136-Cs			<3.6E-03				
137-Cs			<9.2E-07				
139-Ce			<3.1E-07				
140-Ba/La			<7.7E-03				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/11/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19737
Plant Sample ID	:	BOOBM8
Volume/Weight	:	1.0220E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.3E-05	141-Ce			<1.2E-05
40-K	2.67E-05	35		144-Ce/Pr			<1.6E-06
51-Cr			<2.0E-04	152-Eu			<8.2E-07
54-Mn			<4.2E-07	154-Eu			<7.6E-07
57-Co			<2.2E-07	155-Eu			<5.3E-07
58-Co			<1.6E-06	203-Hg			<2.0E-06
59-Fe			<1.0E-05	226-Ra			<1.3E-06
60-Co			<1.0E-06	228-Ra			<1.4E-06
65-Zn			<9.0E-07	228-Th			<5.6E-07
75-Se			<5.9E-07	235-U			<2.1E-07
85-Kr			<5.6E-05	238-U			<4.2E-05
85-Sr			<1.7E-06	241-Am			<6.4E-07
88-Y			<1.0E-06				
94-Nb			<2.8E-07				
95-Nb			<1.1E-05				
95-Zr			<3.3E-06				
99m-Mo/Tc			<3.4E+13				
103-Ru			<6.1E-06				
106-Ru/Rh			<3.3E-06				
108m-Ag			<2.2E-07				
109-Cd			<4.8E-06				
110m-Ag			<6.0E-07				
113-Sn			<9.8E-07				
124-Sb			<1.9E-06				
125-Sb			<7.6E-07				
127-Xe			<5.5E-06				
131-I			<2.5E+00				
131m-Xe			<3.2E-01				
133-Xe			<2.0E+04				
133-Ba			<3.4E-07				
134-Cs			<4.0E-07				
136-Cs			<5.6E-03				
137-Cs			<8.3E-07				
139-Ce			<3.3E-07				
140-Ba/La			<1.2E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19738
Plant Sample ID	:	BOOBN3
Volume/Weight	:	1.0303E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.8E-05	141-Ce			<1.2E-05
40-K	3.91E-05	29		144-Ce/Pr			<1.7E-06
51-Cr			<1.2E-04	152-Eu			<4.7E-07
54-Mn			<4.8E-07	154-Eu			<9.0E-07
57-Co			<2.3E-07	155-Eu			<5.9E-07
58-Co			<1.9E-06	203-Hg			<2.1E-06
59-Fe			<1.2E-05	226-Ra			<9.8E-07
60-Co			<1.0E-06	228-Ra			<4.9E-06
65-Zn			<1.1E-06	228-Th			<3.5E-06
75-Se			<5.6E-07	235-U			<6.3E-07
85-Kr			<6.8E-05	238-U			<4.8E-05
85-Sr			<2.1E-06	241-Am			<1.4E-06
88-Y			<1.2E-06				
94-Nb			<3.3E-07				
95-Nb			<1.2E-05				
95-Zr			<4.0E-06				
99m-Mo/Tc			<2.1E+13				
103-Ru			<8.0E-06				
106-Ru/Rh			<4.0E-06				
108m-Ag			<2.7E-07				
109-Cd			<5.9E-06				
110m-Ag			<6.5E-07				
113-Sn			<6.1E-07				
124-Sb			<2.3E-06				
125-Sb			<9.2E-07				
127-Xe			<5.5E-06				
131-I			<1.2E+00				
131m-Xe			<3.0E-01				
133-Xe			<2.1E+04				
133-Ba			<2.0E-07				
134-Cs			<4.7E-07				
136-Cs			<5.9E-03				
137-Cs			<1.1E-06				
139-Ce			<3.4E-07				
140-Ba/La			<1.3E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19739
Plant Sample ID	:	BOOBN2
Volume/Weight	:	1.0259E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.1E-05	141-Ce			<1.1E-05
40-K	1.70E-05	54		144-Ce/Pr			<1.6E-06
51-Cr			<1.1E-04	152-Eu			<5.0E-07
54-Mn			<4.5E-07	154-Eu			<6.2E-07
57-Co			<2.2E-07	203-Hg			<2.3E-06
58-Co			<1.7E-06	226-Ra			<8.8E-06
59-Fe			<9.3E-06	228-Ra			<2.6E-06
60-Co			<1.0E-06	228-Th	3.28E-07	59	
65-Zn			<9.6E-07	235-U			<8.7E-07
75-Se			<5.6E-07	238-U			<3.5E-05
85-Kr			<5.8E-05	241-Am			<6.4E-07
85-Sr			<1.7E-06				
88-Y			<1.1E-06				
94-Nb			<2.7E-07				
95-Nb			<1.0E-05				
95-Zr			<3.4E-06				
99m-Mo/Tc			<2.0E+13				
103-Ru			<6.0E-06				
106-Ru/Rh			<3.6E-06				
108m-Ag			<2.3E-07				
109-Cd			<4.5E-06				
110m-Ag			<6.2E-07				
113-Sn			<9.6E-07				
124-Sb			<1.9E-06				
125-Sb			<7.4E-07				
127-Xe			<5.0E-06				
131-I			<1.2E+00				
131m-Xe			<2.8E-01				
133-Xe			<1.5E+04				
133-Ba			<2.0E-07				
134-Cs			<3.8E-07				
136-Cs			<4.5E-03				
137-Cs			<1.3E-06				
139-Ce			<3.2E-07				
140-Ba/La			<1.1E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19740
Plant Sample ID	:	BOOBN1
Volume/Weight	:	1.0235E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.8E-05	141-Ce			<1.2E-05
40-K	2.88E-05	39		144-Ce/Pr			<1.6E-06
51-Cr			<1.2E-04	152-Eu			<4.5E-07
54-Mn			<5.1E-07	154-Eu			<9.8E-07
57-Co			<2.3E-07	155-Eu			<6.1E-07
58-Co			<1.9E-06	203-Hg			<2.3E-06
59-Fe			<1.2E-05	226-Ra			<5.1E-07
60-Co			<1.0E-06	228-Ra			<3.7E-06
65-Zn			<1.4E-06	228-Th			<3.4E-06
75-Se			<5.8E-07	235-U			<7.7E-07
85-Kr			<7.0E-05	238-U			<4.7E-05
85-Sr			<2.1E-06	241-Am			<1.4E-06
88-Y			<1.2E-06				
94-Nb			<3.3E-07				
95-Nb			<1.1E-05				
95-Zr			<4.3E-06				
99m-Mo/Tc			<2.4E+13				
103-Ru			<8.5E-06				
106-Ru/Rh			<4.2E-06				
108m-Ag			<1.5E-07				
109-Cd			<5.7E-06				
110m-Ag			<7.1E-07				
113-Sn			<6.6E-07				
124-Sb			<2.5E-06				
125-Sb			<5.2E-07				
127-Xe			<5.2E-06				
131-I			<1.2E+00				
131m-Xe			<3.1E-01				
133-Xe			<2.3E+04				
133-Ba			<2.0E-07				
134-Cs			<4.7E-07				
136-Cs			<6.6E-03				
137-Cs			<1.0E-06				
139-Ce			<3.5E-07				
140-Ba/La			<1.4E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	05/14/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19741
Plant Sample ID	:	BOOBN1
Volume/Weight	:	1.0235E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<2.2E-05	141-Ce			<1.1E-05
40-K	2.03E-05	41		144-Ce/Pr			<1.4E-06
51-Cr			<1.2E-04	152-Eu			<4.7E-07
54-Mn			<4.6E-07	154-Eu			<7.3E-07
57-Co			<1.9E-07	155-Eu			<4.7E-07
58-Co			<1.7E-06	203-Hg			<2.1E-06
59-Fe			<1.0E-05	226-Ra			<7.1E-07
60-Co			<1.1E-06	228-Ra			<1.6E-06
65-Zn			<1.0E-06	228-Th			<2.1E-05
75-Se			<4.8E-07	235-U			<1.8E-07
85-Kr			<5.1E-05	238-U			<3.8E-05
85-Sr			<1.6E-06	241-Am			<5.6E-07
88-Y			<1.2E-06				
94-Nb			<2.6E-07				
95-Nb			<1.1E-05				
95-Zr			<3.4E-06				
99m-Mo/Tc			<3.4E+13				
103-Ru			<6.2E-06				
106-Ru/Rh			<3.2E-06				
108m-Ag			<2.2E-07				
109-Cd			<3.9E-06				
110m-Ag			<6.3E-07				
113-Sn			<5.0E-07				
124-Sb			<2.0E-06				
125-Sb			<7.5E-07				
127-Xe			<5.2E-06				
131-I			<1.5E+00				
131m-Xe			<3.0E-01				
133-Xe			<1.8E+04				
133-Ba			<2.2E-07				
134-Cs			<4.0E-07				
136-Cs			<5.9E-03				
137-Cs			<5.2E-07				
139-Ce			<3.1E-07				
140-Ba/La			<1.2E-02				

Project Manager _____

Laboratory Manager _____

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Science Applications International Corporation
Radioactive Sample Analysis Report

Plant Name	:	Hanford
Sample Type	:	Special, Solid
Reference Date/Time	:	06/19/90 12:00
Receipt Date	:	10/19/90
Reporting Date	:	11/30/90
SAIC Sample Number	:	19742
Plant Sample ID	:	BOOBP2
Volume/Weight	:	1.0235E+01 g (dry)
Purchase Order Number	:	MPB-SVV-069146
SAIC Project Number	:	1-139-05-656

Measured Concentration
(uCi/g (dry))

Nuclide	Value	% Unc.	MDL	Nuclide	Value	% Unc.	MDL
7-Be			<1.4E-05	141-Ce			<5.4E-06
40-K			<8.4E-06	144-Ce/Pr			<1.4E-06
51-Cr			<5.3E-05	152-Eu			<4.6E-07
54-Mn			<4.0E-07	154-Eu			<8.2E-07
57-Co			<1.9E-07	155-Eu			<5.2E-07
58-Co			<1.2E-06	203-Hg			<1.2E-06
59-Fe			<5.3E-06	226-Ra			<1.2E-06
60-Co			<1.0E-06	228-Ra			<3.1E-06
65-Zn			<9.8E-07	228-Th			<1.9E-06
75-Se			<4.5E-07	235-U			<2.1E-07
85-Kr			<5.7E-05	238-U			<3.3E-05
85-Sr			<1.2E-06	241-Am			<6.4E-07
88-Y			<8.6E-07				
94-Nb			<2.5E-07				
95-Nb			<5.4E-06				
95-Zr			<2.5E-06				
99m-Mo/Tc			<2.9E+09				
103-Ru			<3.4E-06				
106-Ru/Rh			<3.1E-06				
108m-Ag			<2.3E-07				
109-Cd			<4.5E-06				
110m-Ag			<5.6E-07				
113-Sn			<8.3E-07				
124-Sb			<1.2E-06				
125-Sb			<7.6E-07				
127-Xe			<2.5E-06				
131-I			<5.8E-02				
131m-Xe			<3.7E-02				
133-Xe			<1.4E+02				
133-Ba			<2.1E-07				
134-Cs			<4.0E-07				
136-Cs			<7.9E-04				
137-Cs			<1.6E-06				
139-Ce			<2.7E-07				
140-Ba/La			<1.6E-03				

Project Manager _____

Laboratory Manager _____

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SAIC II	Customer ID	INT	Receipt Date	Customer	Reference Date	Type	Sub Type	Vol/Weight	Comments
19728	Discharge Tank	LR	10/19/90	Quad Cities	8/20/90	Waste Water	N/A	1078.6 ml	45 day
19729	U# B00BN4	LR	10/19/90	Westinghouse Hanford (WH)	5/14/90	Special	Solid	10.1493 g	45 day Chain Custody
19730	U# B00BN5	LR	10/19/90	W.H.	5/14/90	Special	Solid	10.3597 g	
19731	Duplicate 19730	LR	10/19/90	W.H.	5/14/90	Special	Solid	10.3597 g	
19732	~~B00BP2~~ U# B00BP3	LR	10/19/90	W.H.	6/19/90	Special	Solid	10.0450 g	
19733	~~B00BP3~~ U# B00BM9	LR	10/19/90	W.H.	4/25/90 ~~6/19/90~~	Special	Solid	10.3231 g	
19734	~~B00BM9~~ U# B00BN0	LR	10/19/90	W.H.	4/25/90	Special	Solid	10.2221 g	
19735	~~B00BN0~~ U# B00BM6	LR	10/19/90	W.H.	5/11/90 ~~4/25/90~~	Special	Solid	10.1387 g	
19736	~~B00BM6~~ U# B00BM7	LR	10/19/90	W.H.	5/11/90	Special	Solid	10.7774 g	
19737	~~B00BM7~~ U# B00BM8	LR	10/19/90	W.H.	5/11/90	Special	Solid	10.2197 g	
19738	~~B00BM8~~ U# B00BN3	LR	10/19/90	W.H.	5/14/90 ~~5/11/90~~	Special	Solid	10.3025 g	
19739	~~B00BN3~~ U# B00BN2	LR	10/19/90	W.H.	5/14/90	Special	Solid	10.2586 g	
19740	U# B00BN1	LR	10/19/90	W.H.	5/14/90	Special	Solid	10.2354 g	
19741	Duplicate 19740	LR	10/19/90	W.H.	5/14/90	Special	Solid	10.2354 g	
19742	U# B00BP2	LR	10/19/90	W.H.	6/19/90	Special	Solid	10.2379 g	
19743	U# B00B77	LR	10/19/90	W.H.	5/14/90	Special	Solid	7.2840 g	
19744	U# B00CH6	LR	10/19/90	W.H.	6/19/90	Special	Solid	5.2954 g	

[redacted]

SAIC
ANALYTICAL LABORATORY
3 CHOKE CHERRY ROAD
ROCKVILLE, MD 20850-4087
[illegible]

SAIC
Employee-Owned Company

WORK ORDER/INVOICE AUTHORIZATION

Plant:	HANFORD	Project No.:	1-139-05-656
SAIC Sample Nos.:	19729-19742	P. O. No.:	MPB-SVV-069146
Date Received:	10/19/90	Date Results Due:	12/03/90
Logged By:	LAURENT RICKS	Log Date:	10/19/90

✓	Quantity	Description	Unit Price	Total
	12	Gamma scan	$	
			$	
			$	
			$	
			$	
			$	
			$	
			$	
			$	
			$	
		Basic value	$	
		Shipping charges (if any)	$	
		Surcharges/late penalties	$	
		Total amount due this invoice	$	

Check (✓) at left if item subcontracted to another lab

Comments:

Sample Delivery Group No. B00BN4

Subcontractor (if any):

Date sent out:

Date received:

Date due back:

Total cost:$
(items checked)

(11/90)