

START 9713512.2632

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Environmental Restoration Contractor **ERC Team**
Interoffice Memorandum

0046111

Job No. 22192
Written Response Required? NO
Closes CCN: N/A
OU: N/A
TSD: N/A
ERA: N/A
Subject Code: 8600

To: Dave Encke
BHI D&D
X5-53/373-3461

DATE: 18 December, 1995

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Document Control, H4-79, w/a
Project File, H4-79, w/a

FROM: Jeff A. Lerch
Sample Management
X2-10/372-9535

Rec'd Call for JAH



SUBJECT: Concrete analysis for 183-H

Attachment: Sample Results

Eight Concrete samples were analyzed for radioactive components with the following results:

Sample	pCi/gm	Comments
Sample B0GRK0 , EAL01216.		
Gamma Analysis	2.7	Seems low, normal is 10 for ⁴⁰ K.
Strontium-90	<7.4	
Gross Beta analysis	22.6	
Beta from decay chains (naturals)	9.3	
Residual assigned to ⁹⁹ Tc	10.6	

Gross Alpha	1.6	
Alpha Energy Analysis	10.1	No discernable peaks

Sample	pCi/gm	Comments
Sample B0GRK3 , EAL01217.		
Gamma Analysis	13.2	
Strontium-90	<6.6	
Gross Beta analysis	61.3	
Beta from decay chains (naturals)	7.2	
Residual assigned to ⁹⁹ Tc	40.9	

Gross Alpha	4.8	
Alpha Energy Analysis	9.3	No discernable peaks



Sample	pCi/gm	Comments
Sample B0GRK4 , EAL01218.		

Dave Encke

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Gamma Analysis	13.0	
Strontium-90	<9.1	
Gross Beta analysis	195	
Beta from decay chains (naturals)	11.8	
Residual assigned to ⁹⁹ Tc	83.2	
Gross Alpha	28.5	
Alpha Energy Analysis	15.2	No discernable peaks
Sample B0GRK5 , EAL01219.	pCi/gm	Comments
Gamma Analysis	13	
Strontium-90	8.8	
Gross Beta analysis	195	
Beta from decay chains (naturals)	18.1	
Residual assigned to ⁹⁹ Tc	155	
Gross Alpha	7.8	
Alpha Energy Analysis	23.4	Small ²³⁵ U
Sample B0GRK6 , EAL01220.	pCi/gm	Comments
Gamma Analysis	10	
Strontium-90	4.6 ± 0.50	
Gross Beta analysis	143	
Beta from decay chains (naturals)	9.9	
Residual assigned to ⁹⁹ Tc	118	
Gross Alpha	3.7	
Alpha Energy Analysis	12.8	No discernable peaks
Sample B0GRK7 , EAL01221.	pCi/gm	Comments
Gamma Analysis	11.1	
Strontium-90	<7.5	
Gross Beta analysis	137	
Beta from decay chains (naturals)	8.8	
Residual assigned to ⁹⁹ Tc	117	
Gross Alpha	11.9	
Alpha Energy Analysis	11.4	No discernable peaks
Sample B0GRK8 , EAL01222.	pCi/gm	Comments

Dave Encke

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Gamma Analysis	12.1	
Strontium-90	<8.8	
Gross Beta analysis	47.9	
Beta from decay chains (naturals)	7.7	
Residual assigned to ⁹⁹ Tc	28.1	
Gross Alpha	16.5	
Alpha Energy Analysis	9.9	Small ²²⁸ Th peak
Sample B0GRK9 , EAL01223.	pCi/gm	Comments
Gamma Analysis	11	
Strontium-90	<12.7	
Gross Beta analysis	110	
Beta from decay chains (naturals)	8.7	
Residual assigned to ⁹⁹ Tc	90.3	
Gross Alpha	12.1	
Alpha Energy Analysis	11.2	No discernable peaks

The one to two gram samples for the gross alpha and beta were 10 gram splits from the original sample. The alpha sample was a 0.5 gram split from the same source used for the gross analysis. The ⁹⁰Sr activity was based on the ⁹⁰Y that is in equilibrium with the Strontium.

The determination for the beta activity from the natural decay chain was made from the AEA analysis, the alpha analysis has less interference and better sensitivity. Alpha counts were observed, but the spectrum did not display any statistically significant alpha peaks.

If there are any questions, please call Al Davis at 373-9731, thank you.

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK0 183-H Basin
EAL ID Number: EAL01216

Isotope Activity, pCi/g on 1 November, 1995

K40		2.7e+00 +/-	7.9e-01
Co60	<	1.9e-01	
Sb125	<	2.3e-01	
Cs134	<	1.4e+01	
Cs137	<	1.1e-01	
Ce144	<	4.5e-01	
Eu152	<	5.7e-01	
Eu154	<	3.4e-01	
Eu155	<	2.9e-01	
Th32dau	<	3.6e-01	
U235	<	1.0e-01	
U238	<	1.2e+01	
U238dau	<	1.6e-01	
Am241	<	3.7e-01	

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

J. L. ... 6, 11-25 11-1-95
Radiological analyst Date

Albert I. Davis 11-22-95
Albert I. Davis Date
Radiological Manager

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID:	BOGRKO	SOILS	
EAL ID:	EAL01216	Pass screen	(X)
	Concrete Sample	Fail screen	()

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

2.26E+01	Calculated Beta Total Activity (pCi/g)
1.64E+00	Calculated Alpha Total Activity (pCi/g)

2.42E+01	Calculated total activity pCi/g
9.83E+00	Calculated total activity error
2.80E+01	Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

<7.4 90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

J. E. Matthews by A.D.
Radiological Analyst

11-16-95
Date

Albert I. Davis
Albert I. Davis
Radiological Manager

12-06-95
Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK3 183-H Basin
EAL ID Number: EAL01217

Isotope Activity, pCi/g on 1 November, 1995

Isotope	Activity, pCi/g on 1 November, 1995
K40	1.3e+01 +/- 1.6e+00
Co60	< 2.2e-01
Sb125	< 2.5e-01
Cs134	< 1.3e-01
Cs137	1.8e-01 +/- 6.3e-02
Ce144	< 5.9e-01
Eu152	< 6.3e-01
Eu154	< 4.0e-01
Eu155	< 3.4e-01
Th32dau	5.9e-01 +/- 1.9e-01
U235	3.5e-01 +/- 9.6e-02
U238	< 1.4e+01
U238dau	3.6e-01 +/- 1.4e-01
Am241	< 4.5e-01

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

J. L. ... 11-1-95
Radiological analyst Date

Albert I. Davis
Albert I. Davis 11-22-95
Radiological Manager Date

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID:	BOGRK3	SOILS	
EAL ID:	EAL01217	Pass screen	(X)
	Concrete Sample	Fail screen	()

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

6.13E+01	Calculated Beta Total Activity (pCi/g)
4.67E+00	Calculated Alpha Total Activity (pCi/g)

6.60E+01	Calculated total activity pCi/g
9.04E+00	Calculated total activity error
2.12E+01	Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

<6.6 90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

L.E. Mathum
Radiological Analyst

11-6-95
Date

Albert I. Davis
Albert I. Davis
Radiological Manager

12-06-95
Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK4 183-H Basin
EAL ID Number: EAL01218

Isotope Activity, pCi/g on 1 November, 1995

Isotope	Activity, pCi/g on 1 November, 1995
K40	1.3e+01 +/- 1.5e+00
Co60	< 2.2e-01
Sb125	< 2.0e-01
Cs134	< 1.2e-01
Cs137	< 1.0e-01
Ce144	< 5.1e-01
Eu152	< 4.9e-01
Eu154	< 3.3e-01
Eu155	< 2.9e-01
Th32dau	5.7e-01 +/- 1.8e-01
U235	1.7e-01 +/- 7.9e-02
U238	< 1.3e+01
U238dau	3.2e-01 +/- 1.3e-01
Am241	< 4.0e-01

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

J. J. [Signature] 11-1-95
Radiological analyst Date

Albert I. Davis 11-22-95
Radiological Manager Date

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID:	BOGRK4	SOILS	
EAL ID:	EAL01218	Pass screen	()
	Concrete Sample	Fail screen	(X)

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

1.08E+02	Calculated Beta Total Activity (pCi/g)
1.94E+01	Calculated Alpha Total Activity (pCi/g)

1.27E+02	Calculated total activity pCi/g
2.85E+01	Calculated total activity error
6.19E+01	Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

<9.1 90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

L E Matthews
Radiological Analyst

11-6-95
Date

Albert I. Davis
Albert I. Davis
Radiological Manager

12-06-95
Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK5 183-H Basin
EAL ID Number: EAL01219

Isotope Activity, pCi/g on 1 November, 1995

K40		1.3e+01 +/-	1.5e+00
Co60	<	2.1e-01	
Sb125	<	2.6e-01	
Cs134	<	1.2e-01	
Cs137		2.9e-01 +/-	8.4e-02
Ce144	<	6.1e-01	
Eu152	<	5.1e-01	
Eu154	<	3.1e-01	
Eu155	<	3.6e-01	
Th32dau	<	3.3e-01	
U235		4.4e-01 +/-	9.6e-02
U238	<	1.4e+01	
U238dau		3.1e-01 +/-	1.4e-02
Am241	<	4.3e-01	

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

J. F. (Signature) 11-1-95
Radiological analyst Date

Albert I. Davis (Signature) 11-22-95
Radiological Manager Date

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID:	BOGRK4	SOILS	
EAL ID:	EAL01219	Pass screen	()
	Concrete Sample	Fail screen	(X)

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

1.95E+02	Calculated Beta Total Activity (pCi/g)
7.75E+00	Calculated Alpha Total Activity (pCi/g)

2.03E+02	Calculated total activity pCi/g
1.40E+01	Calculated total activity error
2.10E+01	Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

8.80E+00	90-Sr pCi/g sample
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The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

S.E. Matthews
Radiological Analyst

11-6-95
Date

Albert I. Davis
Albert I. Davis
Radiological Manager

12-06-95
Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK6 183-H Basin
EAL ID Number: EAL01220

Isotope Activity, pCi/g on 2 November, 1995

K40	1.0e+01 +/-	1.3e+00
Co60	<	1.3e+00
Sb125	<	2.8e-01
Cs134	<	1.4e-01
Cs137	<	1.2e-01
Ce144	<	6.2e-01
Eu152	<	3.0e-01
Eu154	<	3.8e-01
Eu155	<	3.4e-01
Th32dau	<	4.4e-01
U235	<	6.7e-01
U238	<	1.5e+01
U238dau	3.6e-01 +/-	1.4e-01
Am241	<	4.1e-01

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

Stephen L. G. 11-1-95
Radiological analyst Date

Albert I. Davis 11-22-95
Albert I. Davis Date
Radiological Manager

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
 Environmental Analytical Laboratory
 IT Hanford Co.

Customer ID:	BOGRK6	SOILS	
EAL ID:	EAL01220	Pass screen	(X)
	Concrete Sample	Fail screen	()

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

1.43E+02	Calculated Beta Total Activity (pCi/g)
3.68E+00	Calculated Alpha Total Activity (pCi/g)
1.47E+02	Calculated total activity pCi/g
2.69E+01	Calculated total activity error
5.09E+01	Calculated total activity MDA
	Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.
4.60E+00	90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

L. Matthews by [Signature]
 Radiological Analyst

11-6-95
 Date

[Signature]
 Albert I. Davis
 Radiological Manager

12-06-95
 Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK7 183-H Basin
EAL ID Number: EAL01221

Isotope Activity, pCi/g on 2 November, 1995

Isotope	Activity, pCi/g on 2 November, 1995
K40	1.1e+01 +/- 1.4e-01
Co60	< 2.1e-01
Sb125	< 2.5e-01
Cs134	< 1.2e-01
Cs137	1.1e-01 +/- 5.0e-02
Ce144	< 5.3e-01
Eu152	< 6.0e-01
Eu154	< 3.3e-01
Eu155	< 3.1e-01
Th32dau	< 3.2e-01
U235	< 5.6e-01
U238	< 1.3e+01
U238dau	3.5e-01 +/- 1.3e-01
Am241	< 3.6e-01

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

J. L. G. by CID 11-2-95
Radiological analyst Date

Albert I. Davis 11-22-95
Albert I. Davis Date
Radiological Manager

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID: BOGRK7
EAL ID: EAL01221
Concrete Sample

SOILS
Pass screen (X)
Fail screen ()

Other's at 50 pCi limit
Pass screen ()
Fail screen (X)

1.37E+02 Calculated Beta Total Activity (pCi/g)
1.19E+01 Calculated Alpha Total Activity (pCi/g)

1.48E+02 Calculated total activity pCi/g
2.74E+01 Calculated total activity error
5.30E+01 Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

<7.5 90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

L. Matthews
Radiological Analyst

11-6-95
Date

Albert I. Davis
Albert I. Davis
Radiological Manager

12-06-95
Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK8 183-H Basin
EAL ID Number: EAL01222

Isotope Activity, pCi/g on 2 November, 1995

Isotope	Activity, pCi/g on 2 November, 1995
K40	1.2e+01 +/- 1.4e+00
Co60	< 1.8e-01
Sb125	< 2.5e-01
Cs134	< 1.2e-01
Cs137	< 1.1e-01
Ce144	< 5.1e-01
Eu152	< 5.4e-01
Eu154	< 3.7e-01
Eu155	< 3.3e-01
Th32dau	3.9e-01 +/- 1.5e-01
U235	1.8e-01 +/- 8.4e-02
U238	< 1.2e+01
U238dau	4.2e-01 +/- 1.3e-01
Am241	< 3.6e-01

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

J. L. Davis
Radiological analyst Date 11-2-95

Albert I. Davis
Albert I. Davis Date 11-22-95
Radiological Manager

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID:	BOGRK8	SOILS	
EAL ID:	EAL01222	Pass screen	()
	Concrete Sample	Fail screen	(X)

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

4.79E+01	Calculated Beta Total Activity (pCi/g)
1.65E+01	Calculated Alpha Total Activity (pCi/g)

6.44E+01	Calculated total activity pCi/g
1.19E+01	Calculated total activity error
2.96E+01	Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

<8.8 90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.

LE Matthews by [Signature]
Radiological Analyst

11-6-95
Date

Albert I. Davis
Albert I. Davis
Radiological Manager

12-06-95
Date

GAMMA-RAY ENERGY ANALYSIS SCREENING REPORT

Radiometric Laboratory
Environmental Analytical Laboratory
IT Hanford Co.

Customer ID Number: B0GRK9 183-H Basin
EAL ID Number: EAL01223

Isotope Activity, pCi/g on 2 November, 1995

K40	1.1e+01 +/-	1.4e+00
Co60	< 2.2e-01	
Sb125	< 2.3e-01	
Cs134	< 1.1e-01	
Cs137	< 1.1e-01	
Ce144	< 5.9e-01	
Eu152	< 6.0e-01	
Eu154	< 3.4e-01	
Eu155	< 3.0e-01	
Th32dau	3.2e-01 +/-	1.4e-01
U235	2.3e-01 +/-	8.5e-02
U238	< 1.1e+01	
U238dau	3.8e-01 +/-	1.3e-01
Am241	< 4.0e-01	

Definitions:

All errors reported at 2 standard deviations

For soils and natural samples, the following applies:

The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of Th232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced against the gross alpha analysis.

N/R means no result or analysis not requested.

L. E. Mathan by APD 11-2-95
Radiological analyst Date

Albert I. Davis
Albert I. Davis
Radiological Manager
11-22-95
Date

GROSS RADIONUCLIDE SCREENING SAMPLE ANALYSIS REPORT

Radiometric Laboratory
 Environmental Analytical Laboratory
 IT Hanford Co.

Customer ID:	BOGRK9	SOILS	
EAL ID:	EAL01223	Pass screen	(X)
	Concrete Sample	Fail screen	()

Other's at 50 pCi limit	
Pass screen	()
Fail screen	(X)

1.10E+02	Calculated Beta Total Activity (pCi/g)
1.21E+01	Calculated Alpha Total Activity (pCi/g)

1.22E+02	Calculated total activity pCi/g
3.88E+01	Calculated total activity error
8.72E+01	Calculated total activity MDA

Screen sample based on (x) 99-Tc or () 90-Sr for beta activity.

< 13 90-Sr pCi/g sample

The screening for other's is based on 50 pCi/g Beta and Alpha, and 2 pCi/g Alpha including the 2 sigma error.

A passed for Soils indicates that the soil sample contained less than 200 pCi/g total radioactivity of which less than 20 pCi/g is from alpha emitting radionuclides. For conservatism, a failed screen may also have one or more of the following characteristics: The sum of the total gamma activity detected in the soil is above 5 pCi/g; Beta emission from the bulk sample is found above the natural Hanford soil background (corresponding to approximately 5 pCi/g Sr-90 or 100 pCi/g Tc-99); or Alpha emission from the bulk soil is found above the natural Hanford soil background (corresponding to approximately 10 pCi/g Am-241). Naturally occurring radionuclides common to Hanford soil, tritium, and Carbon-14 are not included in the screening measurement.


 Radiological Analyst

11-6-95
 Date


 Albert I. Davis
 Radiological Manager

12-06-95
 Date