



Paragon Analytics

Radiochemistry Case Narrative

Gamma Spectroscopy

New Horizons

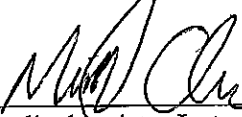
CSMRI / 2135

Paragon Work Order 0405215

1. The following report consists of analysis results for three soil samples received by Paragon on 5/26/04.
2. The samples were prepared as received and a moisture content determination was performed separately to determine the final analytical mass. The results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
3. These samples were prepared according to Paragon Analytics procedure PA SOP739R8. The samples were sealed in steel cans on 6/1/04 and stored for at least 21 days to allow Rn-222 to approach equilibrium with its progeny. The degree of ingrowth achieved prior to analysis on 6/22/04 is at least 97.8%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny ingrowth for these samples would be greater than 98.9%.
4. The samples were analyzed for the presence of gamma emitting radionuclides according to Paragon Analytics procedure PA SOP713R8. The analyses were completed on 6/22/04.
5. PA has observed a reproducible low bias in Ra-226 results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable Ra-226 source in the same geometry and configuration as the samples.
6. The library used for calibration and analysis employs multiple peaks for the Ra-226 progeny, Pb-214 (352 and 295 keV) and Bi-214 (609 and 1120 keV). Using these peaks avoids the use of the problematic Ra-226 photopeak at 186 keV, which suffers from poorly resolvable interference from U-235 at the same energy. Final activity results for Ra-226 are calculated, using the uncertainty-weighted mean of the activities for the four photopeaks, by the Seeker gamma spectroscopy software assuming secular equilibrium.
7. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.

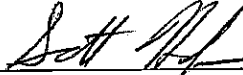
8. The requested MDC of 0.2 pCi/g for Ra-228 was not met for the method blank, GS040603-1MB. Per project manager instruction, the method blank was counted for the same count time as the samples. The results are submitted without further qualification.
9. Due to elevated activity and subsequent elevated background from the Compton Continuum in all samples in this workorder, the requested MDC of 0.2 pCi/gram for Ra-228 was not met. Due to elevated activity and subsequent elevated background from the Compton Continuum in the duplicate of sample C2101M (PA ID 0405215-2D), the requested MDC of 0.5 for Ra-226 was not met. As there is significant activity in this sample, results are reported without further qualification.
10. There are cases where the magnitude of negative activity is greater than the 2-sigma TPU. Under typical conditions, where background data is normally distributed and analyzed by paired observations, this event is likely to occur at least 2.5% of the time. Review of the data does not indicate a problem with the instrument or reporting systems and results are reported without further qualification.
11. No problems were encountered with either the client samples or the associated quality control samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Radiochemistry Instrument Technician

6-29-04
Date



Radiochemistry Final Data Review

6-29-04
Date

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: SDA3
Lab ID: 0405215-1

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 13-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 191 g
Prep Basis: As Received
Moisture(%): 4.400
Result Units: pCi/g
File Name: 041025D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
15262-20-1	Ra-228	2.30 +/- 0.61	1.06	M3
14391-76-5	Ag-110m	-0.02 +/- 0.14	0.27	U
14682-66-7	Al-26	0.07 +/- 0.10	0.17	U
14596-10-2	Am-241	0.35 +/- 0.95	1.60	U
13966-02-4	Be-7	0.4 +/- 1.6	2.9	U
14913-49-6	Bi-212	3.2 +/- 2.6	4.1	U
14733-03-0	Bi-214	1.15 +/- 0.40	0.46	J
14109-32-1	Cd-109	4.6 +/- 3.5	5.5	U
13982-30-4	Ce-139	-0.10 +/- 0.12	0.23	U
14762-78-8	Ce-144	-0.27 +/- 0.64	1.16	U
14093-03-9	Co-56	-0.01 +/- 0.42	0.78	U
13981-50-5	Co-57	-0.004 +/- 0.083	0.146	U
13981-38-9	Co-58	0.05 +/- 0.15	0.28	U
10198-40-0	Co-60	-0.03 +/- 0.13	0.26	U
14392-02-0	Cr-51	-13 +/- 24	45	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8 Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: SDA3

Lab ID: 0405215-1

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 8

Date Collected: 13-May-04

Date Prepared: 01-Jun-04

Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1

QCBatchID: GS040603-1-1

Run ID: GS040603-1A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: As Received

Moisture(%): 4.400

Result Units: pCi/g

File Name: 041025D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-70-9	Cs-134	0.09 +/- 0.14	0.23	U
10045-97-3	Cs-137	-0.03 +/- 0.14	0.26	U
14683-23-9	Eu-152	-0.53 +/- 0.80	1.66	U
15585-10-1	Eu-154	-1.0 +/- 1.1	2.1	U
14391-16-3	Eu-155	0.14 +/- 0.39	0.67	U
14596-12-4	Fe-59	0.12 +/- 0.45	0.81	U
10043-66-0	I-131	1.0 +/- 3.6	6.3	U
13966-00-2	K-40	27.6 +/- 5.3	2.9	
13966-31-9	Mn-54	-0.12 +/- 0.15	0.30	U
13966-32-0	Na-22	0 +/- 0.16	0.31	U
14681-63-1	Nb-94	0.12 +/- 0.14	0.22	U
13967-76-5	Nb-95	0.03 +/- 0.24	0.42	U
15100-28-4	Pa-234m	28 +/- 31	50	U
15092-94-1	Pb-212	2.48 +/- 0.50	0.47	
15067-28-4	Pb-214	1.22 +/- 0.32	0.39	J

Comments:

Qualifiers/Flags:

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Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

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SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide Identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8
Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID:	SDA3
Lab ID:	0405215-1

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 13-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 191 g
Prep Basis: As Received
Moisture(%): 4.400
Result Units: pCi/g
File Name: 041025D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-48-1	Ru-106	1.2 +/- 1.3	2.0	U
14683-10-4	Sb-124	-0.16 +/- 0.21	0.41	U
14234-35-6	Sb-125	0.16 +/- 0.30	0.58	U
13967-63-0	Sc-46	-0.04 +/- 0.15	0.30	U
15623-47-9	Th-227	-0.3 +/- 1.2	2.0	U
15065-10-8	Th-234	20.7 +/- 3.9	4.0	
14913-50-9	Tl-208	0.94 +/- 0.26	0.26	
15117-96-1	U-235	1.08 +/- 0.88	1.39	U
13982-39-3	Zn-65	-0.52 +/- 0.42	0.86	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
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G - Sample density differs by more than 15% of LCS density.

Abbreviations:

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MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID:	SDA3
Lab ID:	0405215-1

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 13-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 191 g
Prep Basis: As Received
Moisture(%): 4.400
Result Units: pCi/g
File Name: 041025D03B

Library: RA-226

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13982-63-3	Ra-226	1.52 +/- 0.34	0.48	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
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Y2 - Chemical Yield outside default limits.
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M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID:	C2101M
Lab ID:	0405215-2

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 187 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041086D04A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
15262-20-1	Ra-228	1.76 +/- 0.56	0.92	M3
14391-76-5	Ag-110m	-0.04 +/- 0.10	0.21	U
14682-66-7	Al-26	0.06 +/- 0.11	0.20	U
14596-10-2	Am-241	0.14 +/- 0.51	0.89	U
13966-02-4	Be-7	-0.6 +/- 1.1	2.2	U
14913-49-6	Bi-212	2.4 +/- 1.8	2.6	U
14733-03-0	Bi-214	1.68 +/- 0.45	0.44	J
14109-32-1	Cd-109	2.6 +/- 1.9	2.8	U
13982-30-4	Ce-139	-0.085 +/- 0.076	0.149	U
14762-78-8	Ce-144	0.39 +/- 0.48	0.79	U
14093-03-9	Co-56	0.12 +/- 0.32	0.56	U
13981-50-5	Co-57	-0.040 +/- 0.059	0.113	U
13981-38-9	Co-58	0.05 +/- 0.14	0.24	U
10198-40-0	Co-60	0 +/- 0.12	0.24	U
14392-02-0	Cr-51	-3 +/- 15	28	U

Comments:

Qualifiers/Flags:

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TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
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Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 187 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041086D04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-70-9	Cs-134	0 +/- 0.10	0.19	U
10045-97-3	Cs-137	-0.02 +/- 0.12	0.22	U
14683-23-9	Eu-152	0.14 +/- 0.58	1.10	U
15585-10-1	Eu-154	-0.31 +/- 0.53	1.16	U
14391-16-3	Eu-155	0 +/- 0.28	0.49	U
14596-12-4	Fe-59	0.10 +/- 0.30	0.54	U
10043-66-0	I-131	-0.72 +/- 0.95	1.87	U
13966-00-2	K-40	21.8 +/- 4.5	2.5	
13966-31-9	Mn-54	-0.03 +/- 0.13	0.24	U
13966-32-0	Na-22	0.06 +/- 0.11	0.19	U
14681-63-1	Nb-94	0.03 +/- 0.11	0.19	U
13967-76-5	Nb-95	0.08 +/- 0.16	0.26	U
15100-28-4	Pa-234m	3 +/- 15	29	U
15092-94-1	Pb-212	1.68 +/- 0.35	0.30	
15067-28-4	Pb-214	1.97 +/- 0.38	0.36	J

Comments:

Qualifiers/Flags:

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Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

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TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8
Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M

Lab ID: 0405215-2

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8

Date Collected: 26-May-04

Date Prepared: 01-Jun-04

Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1

QCBatchID: GS040603-1-1

Run ID: GS040603-1A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 187 g

Prep Basis: As Received

Moisture(%): 4.700

Result Units: pCi/g

File Name: 041086D04A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-48-1	Ru-106	0.2 +/- 1.0	1.8	U
14683-10-4	Sb-124	-0.05 +/- 0.14	0.26	U
14234-35-6	Sb-125	0.01 +/- 0.23	0.43	U
13967-63-0	Sc-46	-0.14 +/- 0.16	0.33	U
15623-47-9	Th-227	0.61 +/- 0.58	0.91	U
15065-10-8	Th-234	1.9 +/- 1.9	3.1	U
14913-50-9	Tl-208	0.55 +/- 0.18	0.18	
15117-96-1	U-235	-0.18 +/- 0.45	0.84	U
13982-39-3	Zn-65	-0.44 +/- 0.35	0.75	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 187 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041086D04B

Library: RA-226

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13982-63-3	Ra-226	2.30 +/- 0.40	0.43	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Duplicate Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M

Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
15262-20-1	Ra-228	1.72 +/- 0.57	0.77	M3
14391-76-5	Ag-110m	-0.05 +/- 0.13	0.25	U
14682-66-7	Al-26	0.03 +/- 0.13	0.25	U
14596-10-2	Am-241	0.24 +/- 0.70	1.19	U
13966-02-4	Be-7	-0.2 +/- 1.4	2.5	U
14913-49-6	Bi-212	1.3 +/- 2.2	3.7	U
14733-03-0	Bi-214	1.40 +/- 0.40	0.38	J
14109-32-1	Cd-109	2.0 +/- 2.5	4.1	U
13982-30-4	Ce-139	-0.019 +/- 0.095	0.169	U
14762-78-8	Ce-144	-0.20 +/- 0.56	1.02	U
14093-03-9	Co-56	0.17 +/- 0.32	0.54	U
13981-50-5	Co-57	0 +/- 0.071	0.125	U
13981-38-9	Co-58	-0.06 +/- 0.15	0.30	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Duplicate Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
10198-40-0	Co-60	0.02 +/- 0.15	0.29	U
14392-02-0	Cr-51	3 +/- 15	26	U
13967-70-9	Cs-134	0.02 +/- 0.11	0.20	U
10045-97-3	Cs-137	-0.04 +/- 0.13	0.25	U
14683-23-9	Eu-152	0.07 +/- 0.68	1.29	U
15585-10-1	Eu-154	-0.12 +/- 0.57	1.15	U
14391-16-3	Eu-155	0.12 +/- 0.32	0.55	U
14596-12-4	Fe-59	-0.13 +/- 0.31	0.64	U
10043-66-0	I-131	-0.1 +/- 1.1	1.9	U
13966-00-2	K-40	21.0 +/- 4.4	2.6	
13966-31-9	Mn-54	-0.14 +/- 0.12	0.26	U
13966-32-0	Na-22	0.01 +/- 0.15	0.28	U
14681-63-1	Nb-94	-0.09 +/- 0.12	0.23	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Duplicate Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-76-5	Nb-95	-0.12 +/- 0.16	0.32	U
15100-28-4	Pa-234m	2 +/- 21	39	U
15092-94-1	Pb-212	1.22 +/- 0.31	0.34	
15067-28-4	Pb-214	1.60 +/- 0.36	0.42	J
13967-48-1	Ru-106	-0.2 +/- 1.1	2.1	U
14683-10-4	Sb-124	-0.01 +/- 0.15	0.27	U
14234-35-6	Sb-125	0.21 +/- 0.32	0.54	U
13967-63-0	Sc-46	0.08 +/- 0.13	0.23	U
15623-47-9	Th-227	-0.8 +/- 1.0	1.9	U
15065-10-8	Th-234	0.5 +/- 1.5	2.6	U
14913-50-9	Tl-208	0.53 +/- 0.19	0.23	
15117-96-1	U-235	0.19 +/- 0.52	0.89	U
13982-39-3	Zn-65	-0.34 +/- 0.34	0.70	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide Identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Duplicate Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03B

Library: RA-226

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13982-63-3	Ra-226	1.94 +/- 0.38	0.51	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

T1 - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8
Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2102M
Lab ID: 0405215-3

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: As Received
Moisture(%): 6.200
Result Units: pCi/g
File Name: 041087D04A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
15262-20-1	Ra-228	1.65 +/- 0.52	0.69	M3
14391-76-5	Ag-110m	-0.02 +/- 0.13	0.24	U
14682-66-7	Al-26	0.055 +/- 0.064	0.049	TI
14596-10-2	Am-241	-0.25 +/- 0.56	1.04	U
13966-02-4	Be-7	0.6 +/- 1.1	1.9	U
14913-49-6	Bi-212	1.6 +/- 1.8	2.8	U
14733-03-0	Bi-214	3.48 +/- 0.66	0.51	J
14109-32-1	Cd-109	1.0 +/- 3.2	5.4	U
13982-30-4	Ce-139	-0.082 +/- 0.081	0.156	U
14762-78-8	Ce-144	0.17 +/- 0.57	0.98	U
14093-03-9	Co-56	0.69 +/- 0.35	0.42	TI
13981-50-5	Co-57	-0.069 +/- 0.066	0.128	U
13981-38-9	Co-58	-0.06 +/- 0.14	0.29	U
10198-40-0	Co-60	-0.09 +/- 0.16	0.32	U
14392-02-0	Cr-51	1 +/- 17	30	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2102M
Lab ID: 0405215-3

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: As Received
Moisture(%): 6.200
Result Units: pCi/g
File Name: 041087D04A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-70-9	Cs-134	0.07 +/- 0.13	0.22	U
10045-97-3	Cs-137	-0.03 +/- 0.14	0.27	U
14683-23-9	Eu-152	0.44 +/- 0.83	1.43	U
15585-10-1	Eu-154	0.32 +/- 0.65	1.13	U
14391-16-3	Eu-155	0.30 +/- 0.32	0.51	U
14596-12-4	Fe-59	-0.16 +/- 0.38	0.75	U
10043-66-0	I-131	1.0 +/- 1.1	1.8	U
13966-00-2	K-40	24.5 +/- 4.8	2.4	
13966-31-9	Mn-54	-0.14 +/- 0.13	0.28	U
13966-32-0	Na-22	-0.04 +/- 0.14	0.29	U
14681-63-1	Nb-94	0.05 +/- 0.13	0.22	U
13967-76-5	Nb-95	-0.02 +/- 0.24	0.44	U
15100-28-4	Pa-234m	-10 +/- 21	43	U
15092-94-1	Pb-212	1.60 +/- 0.34	0.30	
15067-28-4	Pb-214	3.90 +/- 0.61	0.41	J

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8
Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID:	C2102M
Lab ID:	0405215-3

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: As Received
Moisture(%): 6.200
Result Units: pCi/g
File Name: 041087D04A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-48-1	Ru-106	0.3 +/- 1.1	2.0	U
14683-10-4	Sb-124	-0.04 +/- 0.17	0.31	U
14234-35-6	Sb-125	0 +/- 0.28	0.51	U
13967-63-0	Sc-46	0.09 +/- 0.15	0.25	U
15623-47-9	Th-227	0.94 +/- 0.61	0.90	TI
15065-10-8	Th-234	1.6 +/- 1.4	2.2	U
14913-50-9	Tl-208	0.49 +/- 0.21	0.27	
15117-96-1	U-235	0.01 +/- 0.53	0.94	U
13982-39-3	Zn-65	0.25 +/- 0.71	1.21	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID:	C2102M
Lab ID:	0405215-3

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QC Batch ID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: As Received
Moisture(%): 6.200
Result Units: pCi/g
File Name: 041087D04B

Library: RA-226

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13982-63-3	Ra-226	4.59 +/- 0.67	0.50	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Method Blank Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Lab ID: GS040603-1MB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1

Final Aliquot: 215 g
Result Units: pCi/g

Date Collected: 01-Jun-04
Date Prepared: 01-Jun-04

Run ID: GS040603-1A
Count Time: 30 minutes

File Name: 041088D04A

Library: FANP_New-Horiz

Date Analyzed: 22-Jun-04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
15262-20-1	Ra-228	-0.02 +/- 0.26	0.53	U,M
14391-76-5	Ag-110m	0.008 +/- 0.060	0.114	U
14682-66-7	Al-26	-0.02 +/- 0.10	0.22	U
14596-10-2	Am-241	0.06 +/- 0.27	0.49	U
13966-02-4	Be-7	-0.39 +/- 0.39	0.92	U
14913-49-6	Bi-212	0.22 +/- 0.95	1.78	U
14733-03-0	Bi-214	0.06 +/- 0.17	0.30	U,J
14109-32-1	Cd-109	-0.81 +/- 0.97	2.04	U
13982-30-4	Ce-139	0.012 +/- 0.029	0.051	U
14762-78-8	Ce-144	0.04 +/- 0.21	0.39	U
14093-03-9	Co-56	-0.06 +/- 0.11	0.26	U
13981-50-5	Co-57	0.013 +/- 0.026	0.045	U
13981-38-9	Co-58	0.016 +/- 0.055	0.103	U
10198-40-0	Co-60	-0.010 +/- 0.080	0.168	U
14392-02-0	Cr-51	-1.9 +/- 2.9	6.5	U

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC or less than the associated TPU
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide identification and/or quantitation is tentative.
- TI - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- M - Requested MDC not met.
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- MDC - Minimum Detectable Concentration (see PAI SOP 709)
- BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Method Blank Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Lab ID: GS040603-1MB

Sample Matrix: SOIL

Prep Batch: GS040603-1

Final Aliquot: 215 g

Prep SOP: PAI 739 Rev 8

QC Batch ID: GS040603-1-1

Result Units: pCi/g

Date Collected: 01-Jun-04

Run ID: GS040603-1A

File Name: 041088D04A

Date Prepared: 01-Jun-04

Count Time: 30 minutes

Library: FANP_New-Horiz

Date Analyzed: 22-Jun-04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-70-9	Cs-134	-0.011 +/- 0.072	0.138	U
10045-97-3	Cs-137	-0.031 +/- 0.061	0.134	U
14683-23-9	Eu-152	0.05 +/- 0.21	0.46	U
15585-10-1	Eu-154	0.12 +/- 0.32	0.59	U
14391-16-3	Eu-155	0.05 +/- 0.13	0.22	U
14596-12-4	Fe-59	0.04 +/- 0.12	0.23	U
10043-66-0	I-131	0.017 +/- 0.054	0.098	U
13966-00-2	K-40	0.08 +/- 0.88	1.73	U
13966-31-9	Mn-54	-0.024 +/- 0.066	0.140	U
13966-32-0	Na-22	-0.025 +/- 0.048	0.127	U
14681-63-1	Nb-94	-0.036 +/- 0.077	0.157	U
13967-76-5	Nb-95	0.037 +/- 0.069	0.119	U
15100-28-4	Pa-234m	7 +/- 11	20	U
15092-94-1	Pb-212	0.011 +/- 0.085	0.156	U
15067-28-4	Pb-214	-0.05 +/- 0.12	0.24	U,J

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC or less than the associated TPU
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide identification and/or quantitation is tentative.
- T1 - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- M - Requested MDC not met.
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- MDC - Minimum Detectable Concentration (see PAI SOP 709)
- BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Method Blank Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Lab ID: GS040603-1MB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 8

Date Collected: 01-Jun-04

Date Prepared: 01-Jun-04

Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1

QC Batch ID: GS040603-1-1

Run ID: GS040603-1A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 041088D04A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13967-48-1	Ru-106	0.28 +/- 0.52	0.91	U
14683-10-4	Sb-124	0.028 +/- 0.073	0.128	U
14234-35-6	Sb-125	0.02 +/- 0.12	0.23	U
13967-63-0	Sc-46	0.014 +/- 0.056	0.107	U
15623-47-9	Th-227	-0.10 +/- 0.27	0.54	U
15065-10-8	Th-234	-0.43 +/- 0.63	1.28	U
14913-50-9	Tl-208	0.044 +/- 0.070	0.118	U
15117-96-1	U-235	-0.05 +/- 0.24	0.46	U
13982-39-3	Zn-65	-0.04 +/- 0.15	0.32	U

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC or less than the associated TPU
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide identification and/or quantitation is tentative.
- T1 - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- M - Requested MDC not met.
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- MDC - Minimum Detectable Concentration (see PAI SOP 709)
- BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Method Blank Results

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Lab ID: GS040603-1MB

Sample Matrix: SOIL

Prep Batch: GS040603-1

Final Aliquot: 215 g

Prep SOP: PAI 739 Rev 8

QCBatchID: GS040603-1-1

Result Units: pCi/g

Date Collected: 01-Jun-04

Run ID: GS040603-1A

File Name: 041088D04B

Date Prepared: 01-Jun-04

Count Time: 30 minutes

Date Analyzed: 22-Jun-04

Library: RA-226

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Lab Qualifier
13982-63-3	Ra-226	-0.06 +/- 0.15	0.29	U

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC or less than the associated TPU
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide Identification and/or quantitation is tentative.
- TI - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- M - Requested MDC not met.
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- MDC - Minimum Detectable Concentration (see PAI SOP 709)
- BDL - Below Detection Limit

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Laboratory Control Sample(s)

Lab Name: Paragon Analytcs

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Lab ID: GS040603-1ALCS

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 01-Jun-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes

Final Aliquot: 215 g
Result Units: pCi/g
File Name: 041027D03A

Library: FANP_New-Horiz

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	481 +/- 57	7	470	102	85 - 115	P
10198-40-0	Co-60	174 +/- 20	1	180	96.9	85 - 115	P
10045-97-3	Cs-137	187 +/- 22	1	176	107	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS Recovery within control limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halfives.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Laboratory Control Sample(s)

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Lab ID: GS040603-1LCS

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 01-Jun-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes

Final Aliquot: 215 g
Result Units: pCi/g
File Name: 041028D03A

Library: RA-226

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	465 +/- 54	3	471	98.7	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS Recovery within control limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halfives.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Duplicate Sample Results (DER)

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03A

Library: FANP_New-Horiz

CASNO	Analyte	Sample Result +/- 2 s TPU	Duplicate Result +/- 2 s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.76 +/- 0.56	1.72 +/- 0.57	0.05	2.13	M3
14391-76-5	Ag-110m	-0.04 +/- 0.10	-0.05 +/- 0.13	0.06	2.13	U
14682-66-7	Al-26	0.06 +/- 0.11	0.03 +/- 0.13	0.17	2.13	U
14596-10-2	Am-241	0.14 +/- 0.51	0.24 +/- 0.70	0.11	2.13	U
13966-02-4	Be-7	-0.6 +/- 1.1	-0.2 +/- 1.4	0.21	2.13	U
14913-49-6	Bi-212	2.4 +/- 1.8	1.3 +/- 2.2	0.38	2.13	U
14733-03-0	Bi-214	1.68 +/- 0.45	1.40 +/- 0.40	0.47	2.13	J
14109-32-1	Cd-109	2.6 +/- 1.9	2.0 +/- 2.5	0.18	2.13	U
13982-30-4	Ce-139	-0.085 +/- 0.076	-0.019 +/- 0.095	0.55	2.13	U
14762-78-8	Ce-144	0.39 +/- 0.48	-0.20 +/- 0.56	0.79	2.13	U
14093-03-9	Co-56	0.12 +/- 0.32	0.17 +/- 0.32	0.12	2.13	U
13981-50-5	Co-57	-0.040 +/- 0.059	0 +/- 0.071	0.44	2.13	U
13981-38-9	Co-58	0.05 +/- 0.14	-0.06 +/- 0.15	0.54	2.13	U
10198-40-0	Co-60	0 +/- 0.12	0.02 +/- 0.15	0.12	2.13	U
14392-02-0	Cr-51	-3 +/- 15	3 +/- 15	0.25	2.13	U
13967-70-9	Cs-134	0 +/- 0.10	0.02 +/- 0.11	0.17	2.13	U
10045-97-3	Cs-137	-0.02 +/- 0.12	-0.04 +/- 0.13	0.10	2.13	U

Comments:

Duplicate Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- LT - Result is less than Request MDC, greater than sample specific MDC
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- DER - Duplicate Error Ratio
- BDL - Below Detection Limit
- NR - Not Reported

- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide identification and/or quantitation is tentative.
- TI - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Duplicate Sample Results (DER)

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

ClientProject ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03A

Library: FANP_New-Horiz

14683-23-9	Eu-152	0.14 +/- 0.58	0.07 +/- 0.68	0.08	2.13	U
15585-10-1	Eu-154	-0.31 +/- 0.53	-0.12 +/- 0.57	0.25	2.13	U
14391-16-3	Eu-155	0 +/- 0.28	0.12 +/- 0.32	0.28	2.13	U
14596-12-4	Fe-59	0.10 +/- 0.30	-0.13 +/- 0.31	0.53	2.13	U
10043-66-0	I-131	-0.72 +/- 0.95	-0.1 +/- 1.1	0.46	2.13	U
13966-00-2	K-40	21.8 +/- 4.5	21.0 +/- 4.4	0.13	2.13	
13966-31-9	Mn-54	-0.03 +/- 0.13	-0.14 +/- 0.12	0.62	2.13	U
13966-32-0	Na-22	0.06 +/- 0.11	0.01 +/- 0.15	0.31	2.13	U
14681-63-1	Nb-94	0.03 +/- 0.11	-0.09 +/- 0.12	0.73	2.13	U
13967-76-5	Nb-95	0.08 +/- 0.16	-0.12 +/- 0.16	0.94	2.13	U
15100-28-4	Pa-234m	3 +/- 15	2 +/- 21	0.06	2.13	U
15092-94-1	Pb-212	1.68 +/- 0.35	1.22 +/- 0.31	0.96	2.13	
15067-28-4	Pb-214	1.97 +/- 0.38	1.60 +/- 0.36	0.70	2.13	J
13967-48-1	Ru-106	0.2 +/- 1.0	-0.2 +/- 1.1	0.22	2.13	U
14683-10-4	Sb-124	-0.05 +/- 0.14	-0.01 +/- 0.15	0.18	2.13	U
14234-35-6	Sb-125	0.01 +/- 0.23	0.21 +/- 0.32	0.49	2.13	U
13967-63-0	Sc-46	-0.14 +/- 0.16	0.08 +/- 0.13	1.05	2.13	U
15623-47-9	Th-227	0.61 +/- 0.58	-0.8 +/- 1.0	1.25	2.13	U
15065-10-8	Th-234	1.9 +/- 1.9	0.5 +/- 1.5	0.58	2.13	U

Comments:

Duplicate Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- LT - Result is less than Request MDC, greater than sample specific MDC
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits

Abbreviations:

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- DER - Duplicate Error Ratio
- BDL - Below Detection Limit
- NR - Not Reported

- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide identification and/or quantitation is tentative.
- TI - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Duplicate Sample Results (DER)

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

Client Project ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QC Batch ID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03A

Library: FANP_New-Horiz

14913-50-9	Tl-208	0.55 +/- 0.18	0.53 +/- 0.19	0.07	2.13	
15117-96-1	U-235	-0.18 +/- 0.45	0.19 +/- 0.52	0.54	2.13	U
13982-39-3	Zn-65	-0.44 +/- 0.35	-0.34 +/- 0.34	0.22	2.13	U

Comments:

Duplicate Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- LT - Result is less than Request MDC, greater than sample specific MDC
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- G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1

Gamma Spectroscopy Results

PAI 713 Rev 8

Duplicate Sample Results (DER)

Lab Name: Paragon Analytics

Work Order Number: 0405215

Client Name: New Horizons

Client Project ID: CSMRI 2135

Field ID: C2101M
Lab ID: 0405215-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 8
Date Collected: 26-May-04
Date Prepared: 01-Jun-04
Date Analyzed: 22-Jun-04

Prep Batch: GS040603-1
QCBatchID: GS040603-1-1
Run ID: GS040603-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: As Received
Moisture(%): 4.700
Result Units: pCi/g
File Name: 041026D03B

Library: RA-226

CASNO	Analyte	Sample Result +/- 2 s TPU	Duplicate Result +/- 2 s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.30 +/- 0.40	1.94 +/- 0.38	0.65	2.13	M3

Comments:

Duplicate Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- LT - Result is less than Request MDC, greater than sample specific MDC
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- DER - Duplicate Error Ratio
- BDL - Below Detection Limit
- NR - Not Reported

- SQ - Spectral quality prevents accurate quantitation.
- SI - Nuclide identification and/or quantitation is tentative.
- T1 - Nuclide identification is tentative.
- R - Nuclide has exceeded 8 half-lives.
- G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0405215-1