0077903

# SAF-RC-087
# 618-7 Burial Ground - Soil
# FINAL DATA PACKAGE

**COMPLETE COPY OF DATA PACKAGE TO:**

| | | |
|---|---|---|
| Rick Kerkow | L6-06 | KW 5/29/08<br>Initials/Date |
| Kathy Wendt | H4-21 | KW 5/29/08<br>Initials/Date |

**COMMENTS:**

**SDG J00166** **SAF-RC-087**

Rad only Chem only X Rad & Chem

X Complete Partial

**WASTE SITE: 618-7 Burial Ground/Stockpiles**

RECEIVED
JUN 11 2008
EDMC

Analytical Data Package Prepared For

# Washington Closure Hanford

Radiochemical Analysis By

## TestAmerica

*2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.*

Assigned Laboratory Code: TARLIH

*Data Package Contains* 60 *Pages*

Report No.: 39136

**Results in this report relate only to the sample(s) analyzed.**

| SDG No. | Order No. | Client Sample ID (List Order) | Lot-Sa No. | Work Order | Report DB ID | Batch No. |
|---|---|---|---|---|---|---|
| J00166A | RC-087 | J16DX8 | J8D090287-1 | KK1CE1AE | 9KK1CE10 | 8101290 |
| | | J16DX8 | J8D090287-1 | KK1CE1AD | 9KK1CE10 | 8101295 |
| | | J16DX8 | J8D090287-1 | KK1CE2AC | 9KK1CE20 | 8115217 |
| | | J16DX8 | J8D090287-1 | KK1CE1AK | 9KK1CE10 | 8128241 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

May 29, 2008

Attention: Joan Kessner

| | | |
|---|---|---|
| SAF Number | : | RC-087 |
| Date SDG Closed | : | April 9, 2008 |
| Number of Samples | : | One (1) |
| Sample Type | : | Soil |
| SDG Number | : | J00166A |
| Data Deliverable | : | 15 – Day / Summary |

## CASE NARRATIVE

### I. Introduction

On April 9, 2008 TestAmerica received a request to analyze additional analyses on sample JADX8. The original receipt date was April 3, 2008 and the analysis was quick turn metals by ICP-6010. The sample was reassigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

| WCH ID# | STLR ID# | MATRIX | DATE OF RECEIPT |
|---|---|---|---|
| JADX8 | KK1CE (KKNG6) | SOIL | 4/09/08 |

### I. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

### III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

**Alpha Spectroscopy**
Plutonium-238, -239/240 by method RICH-RC-5010
Uranium 234, 235 and 238 by method RICH-RC-5039
Americium 241 by method RICH-RC-5072
**Gamma Spectroscopy**
Gamma Spec by method RICH-RC-5017
**Laser Induced Phosphorimetry**
Total Uranium by method RICH-RC-5058

## IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

## V. Comments

**Alpha Spectroscopy**

Plutonium-238, -239/240 by method RICH-RC-5010:

Due to insufficient sample volume, the plutonium aliquots were taken from the gamma fraction after the preliminary gamma results were emailed. Significant amounts of uranium were noted in the sample (J16DX8) and sample duplicate (J16DX8 DUP) spectra. The preliminary results were reported on April 24, 2008. Except as noted, the LCS, batch blank, sample and sample duplicate (J16DX8) results are within contractual requirements.

Uranium 234, 235 and 238 by method RICH-RC-5039:

Due to insufficient sample volume, the uranium aliquot was taken from the gamma fraction after the preliminary gamma results were emailed. Analysis by isotopic method was unsuccessful due to elevated levels of uranium. Isotopic ratios appear to be consistent with natural enrichment levels of U-235. The client was informed on April 30, 2008.

Americium 241 by method RICH-RC-5072:

Due to insufficient sample volume, the americium aliquots were taken from the gamma fraction after the preliminary gamma results were emailed. High amounts of uranium caused interference in the first analysis. The samples were prepared for a reanalysis. The samples were run through two Uteva cartridges to remove uranium form the samples. The preliminary results were reported on April 29, 2008. Except as noted, the LCS, batch blank, sample and sample duplicate (J16DX8) results are within contractual requirements.

**Gamma Spectroscopy**

Gamma Spec by method RICH-RC-5017:

There was insufficient volume for a duplicate. Sample J16DX8 was recounted on a different detector for the duplicate (J16DX8 DUP). The MDAs were not met due the combination of not enough sample for the normal 600 gram minimum aliquots and high counts of Uranium causing elevated backgrounds. The dead time was also slightly elevated at 6.7% due to the high Uranium level. The preliminary gamma results were emailed on April 17, 2008. Except as noted, the LCS, batch blank, samples and sample duplicate (J16DX8) results are within contractual requirements.

**Total Uranium**

Total Uranium by method RICH-RC-5058:

On May 1, 2008 the client requested total uranium. Due to the high amounts of uranium in this sample, a one gram aliquot was taken, leached and diluted to 100 ml. 1 ml of this dilution was then taken and again diluted by 100 ml. 1 ml was again taken and diluted to 100 ml of which 0.1 ml was analyzed. These repeated dilutions may have introduced greater error into the calculation. The preliminary results were sent on May 19, 2008. Except as noted, the LCS, batch blank, samples, sample duplicate (J16DX8), and sample matrix spike (J16DX8) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Seger
Project Manager

## Drinking Water Method Cross References

| | DRINKING WATER ASTM METHOD CROSS REFERENCES | |
|---|---|---|
| | | |
| **Referenced Method** | **Isotope(s)** | **TestAmerica Richland's SOP No.** |
| EPA 901.1 | Cs-134, I-131 | RICH-RC-5017 |
| EPA 900.0 | Alpha & Beta | RICH-RC-5014 |
| EPA 00-02 | Gross Alpha (Coprecipitation) | RICH-RC-5021 |
| EPA 903.0 | Total Alpha Radium (Ra-226) | RICH-RC-5027 |
| EPA 903.1 | Ra-226 | RICH-RC-5005 |
| EPA 904.0 | Ra-228 | RICH-RC-5005 |
| EPA 905.0 | Sr-89/90 | RICH-RC-5006 |
| ASTM D5174 | Uranium | RICH-RC-5058 |
| EPA 906.0 | Tritium | RICH-RC-5007 |

## Results in this report relate only to the sample(s) analyzed.

### Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties ($u_i$) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty ($u_c$) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/?n), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

## Report Definitions

| | |
|---|---|
| **Action Lev** | An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit. |
| **Batch** | The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together. |
| **Bias** | Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30. |
| **COC No** | Chain of Custody Number assigned by the Client or TestAmerica. |
| **Count Error (#s)** | Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background. |
| **Total Uncert (#s)** ***$u_c$ - Combined Uncertainty.*** | All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, ***$u_c$ the combined uncertainty.*** The uncertainty is absolute and in the same units as the result. |
| **(#s), Coverage Factor** | The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations. |
| **CRDL (RL)** | Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL) |
| **Lc** | Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero. |
| **Lot-Sample No** | The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot. |
| **MDC\|MDA** | Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. |
| **Primary Detector** | The instrument identifier associated with the analysis of the sample aliquot. |
| **Ratio U-234/U-238** | The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038. |
| **Rst/MDC** | Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result. |
| **Rst/TotUcert** | Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result. |
| **Report DB No** | Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number. |
| **RER** | The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample. |
| **SDG** | Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt. |
| **Sum Rpt Alpha Spec Rst(s)** | The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units. |
| **Work Order** | The LIMS software assign test specific identifier. |
| **Yield** | The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method. |

# Sample Results Summary

## TestAmerica TARLIH

Ordered by Method, Batch No., Client Sample ID.

Date: 29-May-08

**Report No. :** 39136

**SDG No:** J00166A

| Batch | Client Id Work Order | Parameter | Result +- Uncertainty ( 2s) | Qual | Units | Tracer Yield | MDC or MDA | CRDL | RPD |
|---|---|---|---|---|---|---|---|---|---|
| 8128241 RICHRC5015 | | | | | | | | | |
| J16DX8 | | | | | | | | | |
| | KK1CE1AK | TOTAL-URANIUM | 1800.0 +- 2.07 | | ug/g | | 0.255 | 1.0 | |
| J16DX8 DUP | | | | | | | | | |
| | KK1CE1AM | TOTAL-URANIUM | 1700.0 +- 1.98 | | ug/g | | 0.255 | 1.0 | |
| 8101295 RICHRC5010 | | | | | | | | | |
| J16DX8 | | | | | | | | | |
| | KK1CE1AD | PU-238 | 0.0000 +- 0.0217 | U | pCi/g | 60% | 0.0511 | 1.0 | |
| | | PU239/40 | 0.028 +- 0.0377 | U | pCi/g | 60% | 0.0602 | 1.0 | |
| J16DX8 DUP | | | | | | | | | |
| | KK1CE1AJ | PU-238 | 0.024 +- 0.0341 | U | pCi/g | 53% | 0.0568 | 1.0 | 200.0 |
| | | PU239/40 | 0.0095 +- 0.0242 | U | pCi/g | 53% | 0.0567 | 1.0 | 98.0 |
| 8115217 RICHRC5080 | | | | | | | | | |
| J16DX8 | | | | | | | | | |
| | KK1CE2AC | AM-241 | 0.14 +- 0.105 | | pCi/g | 81% | 0.0932 | 1.0 | |
| J16DX8 DUP | | | | | | | | | |
| | KK1CE2AG | AM-241 | 0.019 +- 0.0397 | U | pCi/g | 81% | 0.093 | 1.0 | 150.1 |
| 8101290 RICHRC5017 | | | | | | | | | |
| J16DX8 | | | | | | | | | |
| | KK1CE1AE | CO-60 | 0.11 +- 0.155 | U | pCi/g | | 0.259 | 0.05 | |
| | | CS-137 | -0.570 +- 0.386 | U | pCi/g | | 0.6 | 0.1 | |
| | | EU-152 | 2.0 +- 1.24 | U | pCi/g | | 1.7 | 0.1 | |
| | | EU-154 | -0.330 +- 0.468 | U | pCi/g | | 0.77 | 0.1 | |
| | | EU-155 | 110.0 +- 13.5 | U | pCi/g | | 3.29 | 0.1 | |
| J16DX8 DUP | | | | | | | | | |
| | KK1CE1AF | CO-60 | -0.023 +- 0.185 | U | pCi/g | | 0.307 | 0.05 | |
| | | CS-137 | -0.420 +- 0.523 | U | pCi/g | | 0.657 | 0.1 | |
| | | EU-152 | -0.500 +- 1.20 | U | pCi/g | | 1.69 | 0.1 | |
| | | EU-154 | 0.43 +- 0.558 | U | pCi/g | | 0.929 | 0.1 | |
| | | EU-155 | 140.0 +- 16.7 | U | pCi/g | | 2.92 | 0.1 | |

**No. of Results:** 18

TestAmerica

rptSTLRchSaSummary2 V5.1.6
A2002

**RPD** - Relative Percent Difference.

**U Qual** - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

# QC Results Summary

Date: 29-May-08

## TestAmerica TARLIH

Ordered by Method, Batch No, QC Type,.

**Report No. :** 39136

**SDG No.:** J00166A

| Batch Work Order | Parameter | Result +- Uncertainty ( 2s) | Qual | Units | Tracer Yield | LCS Recovery | Bias | MDC\|MDA |
|---|---|---|---|---|---|---|---|---|
| **RICHRC5015** | | | | | | | | |
| 8128241 BLANK QC, | | | | | | | | |
| KMN3F1AA | TOTAL-URANIUM | 0.049 +- 0.00506 | U | ug/g | | | | 0.263 |
| 8128241 LCS, | | | | | | | | |
| KMN3F1AC | TOTAL-URANIUM | 11.0 +- 1.23 | | ug/g | | 104% | 0.0 | 0.263 |
| 8128241 MATRIX SPIKE, J16DX8 | | | | | | | | |
| KK1CE1AL | TOTAL-URANIUM | 2600.0 +- 3.08 | | ug/g | | 26667% | 266.0 | 0.255 |
| **RICHRC5010** | | | | | | | | |
| 8101295 BLANK QC, | | | | | | | | |
| KK3CR1AA | PU-238 | -0.0026 +- 0.0134 | U | pCi/g | 99% | | | 0.0363 |
| | PU239/40 | -0.0013 +- 0.0143 | U | pCi/g | 99% | | | 0.0502 |
| 8101295 LCS, | | | | | | | | |
| KK3CR1AC | PU239/40 | 7.2 +- 1.22 | | pCi/g | 91% | 98% | 0.0 | 0.0345 |
| **RICHRC5080** | | | | | | | | |
| 8115217 BLANK QC, | | | | | | | | |
| KLW8A1AA | AM-241 | 0.095 +- 0.0757 | | pCi/g | 95% | | | 0.067 |
| 8115217 LCS, | | | | | | | | |
| KLW8A1AC | AM-241 | 17.0 +- 2.65 | | pCi/g | 104% | 88% | -0.1 | 0.077 |
| **RICHRC5017** | | | | | | | | |
| 8101290 BLANK QC, | | | | | | | | |
| KK3CE1AA | CO-60 | 0.015 +- 0.0339 | U | pCi/g | | | | 0.0609 |
| | CS-137 | -0.014 +- 0.0300 | U | pCi/g | | | | 0.0498 |
| | EU-152 | -0.019 +- 0.0781 | U | pCi/g | | | | 0.13 |
| | EU-154 | 0.049 +- 0.0891 | U | pCi/g | | | | 0.162 |
| | EU-155 | 0.011 +- 0.0533 | U | pCi/g | | | | 0.0893 |
| 8101290 LCS, | | | | | | | | |
| KK3CE1AC | CS-137 | 7.7 +- 1.02 | | pCi/g | | 96% | 0.0 | 0.0691 |

**No. of Results:** 14

TestAmerica

rptSTLRchQcSummary V5.1.6 A2002

**Bias** - (Result/Expected)-1 as defined by ANSI N13.30.

**U Qual** - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

TESTAMERICA

# FORM I

## SAMPLE RESULTS

Date: 29-May-08

| | | | | | |
|---|---|---|---|---|---|
| Lab Name: | TestAmerica | SDG: | J00166A | Collection Date: | 3/28/2008 9:15:00 AM |
| Lot-Sample No.: | J8D090287-1 | Report No. : | 39136 | Received Date: | 4/9/2008 12:00:00 PM |
| Client Sample ID: | J16DX8 | COC No. : | RC-087-059 | Matrix: | SOIL |

Ordered by Client Sample ID, Batch No.

| Parameter | Result | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA, Action Lev | Rpt Unit, Lc | Yield CRDL(RL) | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch: 8101290 | RICHRC5017 | | | Work Order: | KK1CE1AE | | Report DB ID: | 9KK1CE10 | | | | |
| CO-60 | 0.11 | U | 0.16 | 0.16 | 0.259 | pCi/g | | 0.43 | 4/15/08 10:50 a | | 42.1 | GER7$1 |
| | | | | | | | 0.05 | (1.4) | | | g | |
| CS-137 | -0.570 | U | 0.39 | 0.39 | 0.6 | pCi/g | | -0.94 | 4/15/08 10:50 a | | 42.1 | GER7$1 |
| | | | | | | | 0.1 | -(2.9) | | | g | |
| EU-152 | 2.0 | U | 1.2 | 1.2 | 1.7 | pCi/g | | (1.2) | 4/15/08 10:50 a | | 42.1 | GER7$1 |
| | | | | | | | 0.1 | (3.2) | | | g | |
| EU-154 | -0.330 | U | 0.47 | 0.47 | 0.77 | pCi/g | | -0.42 | 4/15/08 10:50 a | | 42.1 | GER7$1 |
| | | | | | | | 0.1 | -(1.4) | | | g | |
| EU-155 | 110.0 | U | 14.0 | 14.0 | 3.29 | pCi/g | | (34.2) | 4/15/08 10:50 a | | 42.1 | GER7$1 |
| | | | | | | | 0.1 | (16.6) | | | g | |
| Batch: 8101295 | RICHRC5010 | | | Work Order: | KK1CE1AD | | Report DB ID: | 9KK1CE10 | | | | |
| PU-238 | 0.0000 | U | 0.0000 | 0.022 | 0.0511 | pCi/g | 60% | 0. | 4/23/08 12:25 p | | 1.01 | ALP37 |
| | | | | | | 0.0111 | 1.0 | 0. | | | G | |
| PU239/40 | 0.028 | U | 0.037 | 0.038 | 0.0602 | pCi/g | 60% | 0.46 | 4/23/08 12:25 p | | 1.01 | ALP37 |
| | | | | | | 0.0157 | 1.0 | (1.5) | | | G | |
| Batch: 8115217 | RICHRC5080 | | | Work Order: | KK1CE2AC | | Report DB ID: | 9KK1CE20 | | | | |
| AM-241 | 0.14 | | 0.10 | 0.10 | 0.0932 | pCi/g | 81% | (1.5) | 4/28/08 03:48 p | | 0.5 | ALP123 |
| | | | | | | 0.0203 | 1.0 | (2.6) | | | G | |
| Batch: 8128241 | RICHRC5015 | | | Work Order: | KK1CE1AK | | Report DB ID: | 9KK1CE10 | | | | |
| TOTAL-URANIUM | 1800.0 | | 0.0000 | 2.1 | 0.255 | ug/g | | (6872.6) | 5/12/08 12:24 p | | 0.00103 | KPAW3 |
| | | | | | | 0.0902 | 1.0 | (1692.3) | | | ML | |

TestAmerica
rptSTLRchSample
V5.1.6 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

TESTAMERICA

# FORM I

## SAMPLE RESULTS

Date: 29-May-08

| | | | | | |
|---|---|---|---|---|---|
| Lab Name: | TestAmerica | SDG: | J00166A | Collection Date: | 3/28/2008 9:15:00 AM |
| Lot-Sample No.: | J8D090287-1 | Report No. : | 39136 | Received Date: | 4/9/2008 12:00:00 PM |
| Client Sample ID: | J16DX8 | COC No. : | RC-087-059 | Matrix: | SOIL |

Ordered by Client Sample ID, Batch No.

| Parameter | Result | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA, Action Lev | Rpt Unit, Lc | Yield CRDL(RL) | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

No. of Results: 9 Comments:

TestAmerica
rptSTLRchSample
V5.1.6 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

TESTAMERICA

# FORM II

Date: 29-May-08

## DUPLICATE RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Lab Name: | TestAmerica | SDG: | J00166A | Collection Date: | 3/28/2008 9:15:00 AM |
| Lot-Sample No.: | J8D090287-1 | Report No. : | 39136 | Received Date: | 4/9/2008 12:00:00 PM |
| Client Sample ID: | J16DX8 DUP | COC No. : | RC-087-059 | Matrix: | SOIL |

| Parameter | Result, Orig Rst | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA, Action Lev | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch: 8101290 | RICHRC5017 | | | Work Order: KK1CE1AF | | Report DB ID: KK1CE1FR | | | Orig Sa DB ID: 9KK1CE10 | | | |
| CO-60 | -0.023 | U | 0.19 | 0.19 | 0.307 | pCi/g | | -0.08 | 4/16/08 08:10 a | | 42.1 | GER6$1 |
| | 0.112 | U | RPD | 305.7 | | 0.05 | | -0.25 | | | g | |
| CS-137 | -0.420 | U | 0.52 | 0.52 | 0.657 | pCi/g | | -0.64 | 4/16/08 08:10 a | | 42.1 | GER6$1 |
| | -0.566 | U | RPD | -30.0 | | 0.1 | | -(1.6) | | | g | |
| EU-152 | -0.500 | U | 1.2 | 1.2 | 1.69 | pCi/g | | -0.3 | 4/16/08 08:10 a | | 42.1 | GER6$1 |
| | 1.97 | U | RPD | 336.2 | | 0.1 | | -0.83 | | | g | |
| EU-154 | 0.43 | U | 0.56 | 0.56 | 0.929 | pCi/g | | 0.46 | 4/16/08 08:10 a | | 42.1 | GER6$1 |
| | -0.327 | U | RPD | 1498.8 | | 0.1 | | (1.5) | | | g | |
| EU-155 | 140.0 | U | 17.0 | 17.0 | 2.92 | pCi/g | | (48.) | 4/16/08 08:10 a | | 42.1 | GER6$1 |
| | 112.0 | U | RPD | 22.3 | | 0.1 | | (16.8) | | | g | |
| Batch: 8101295 | RICHRC5010 | | | Work Order: KK1CE1AJ | | Report DB ID: KK1CE1JR | | | Orig Sa DB ID: 9KK1CE10 | | | |
| PU-238 | 0.024 | U | 0.034 | 0.034 | 0.0568 | pCi/g | 53% | 0.42 | 4/23/08 12:26 p | | 1.02 | ALP38 |
| | 0.0 | U | RPD | 200.0 | | 1.0 | | (1.4) | | | G | |
| PU239/40 | 0.0095 | U | 0.024 | 0.024 | 0.0567 | pCi/g | 53% | 0.17 | 4/23/08 12:26 p | | 1.02 | ALP38 |
| | 0.0277 | U | RPD | 98.0 | | 1.0 | | 0.78 | | | G | |
| | | | | | | | | | *Alpha Spec Result Sum = 3.3E-02* | | | |
| Batch: 8115217 | RICHRC5080 | | | Work Order: KK1CE2AG | | Report DB ID: KK1CE2GR | | | Orig Sa DB ID: 9KK1CE20 | | | |
| AM-241 | 0.019 | U | 0.040 | 0.040 | 0.093 | pCi/g | 81% | 0.21 | 4/28/08 03:49 p | | 0.5 | ALP124 |
| | 0.136 | | RPD | 150.1 | | 1.0 | | 0.98 | | | G | |
| | | | | | | | | | *Alpha Spec Result Sum = 5.3E-02* | | | |

TestAmerica
rptSTLRchDupV5.1
.6 A2002

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

TESTAMERICA

# FORM II

Date: 29-May-08

## DUPLICATE RESULTS

| | | | | | |
|---|---|---|---|---|---|
| **Lab Name:** | TestAmerica | **SDG:** | J00166A | **Collection Date:** | 3/28/2008 9:15:00 AM |
| **Lot-Sample No.:** | J8D090287-1 | **Report No. :** | 39136 | **Received Date:** | 4/9/2008 12:00:00 PM |
| **Client Sample ID:** | J16DX8 DUP | **COC No. :** | RC-087-059 | **Matrix:** | SOIL |

| Parameter | Result, Orig Rst | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA, Action Lev | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batch:** 8128241 | RICHRC5015 | | | **Work Order:** KK1CE1AM | | **Report DB ID:** KK1CE1MR | | | **Orig Sa DB ID:** 9KK1CE10 | | | |
| TOTAL-URANIUM | 1700.0 | | 0.0000 | 2.0 | 0.255 | ug/g | | (6553.8) | 5/12/08 12:32 p | | 0.00103 | KPAW3 |
| | 1750.0 | | **RPD** 4.7 | | | 1.0 | | (1688.) | | | ML | |

**No. of Results:** 9 **Comments:**



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rptSTLRchDupV5.1
.6 A2002

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

TESTAMERICA

# FORM II

## BLANK RESULTS

Date: 29-May-08

**Lab Name:** TestAmerica

**Matrix:** SOIL

**SDG:** J00166A

**Report No. :** 39136

| Parameter | Result | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA , | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batch:** 8101295 | RICHRC5010 | | | **Work Order:** | KK3CR1AA | | **Report DB ID:** | KK3CR1AX | | | | |
| PU-238 | -0.0026 | U | 0.013 | 0.013 | 0.0363 | pCi/g | 99% | -0.07 | 4/23/08 12:26 p | | 1.02 | ALP39 |
| | | | | | 0.00946 | 1.0 | | -0.38 | | | G | |
| PU239/40 | -0.0013 | U | 0.014 | 0.014 | 0.0502 | pCi/g | 99% | -0.03 | 4/23/08 12:26 p | | 1.02 | ALP39 |
| | | | | | 0.0164 | 1.0 | | -0.18 | | | G | |
| **Batch:** 8128241 | RICHRC5015 | | | **Work Order:** | KMN3F1AA | | **Report DB ID:** | KMN3F1AB | | | | |
| TOTAL-URANIUM | 0.049 | U | 0.0000 | 0.0051 | 0.263 | ug/g | | 0.19 | 5/12/08 12:12 p | | 0.001 | KPAW3 |
| | | | | | 0.0929 | 1.0 | | (19.5) | | | ML | |
| **Batch:** 8115217 | RICHRC5080 | | | **Work Order:** | KLW8A1AA | | **Report DB ID:** | KLW8A1AB | | | | |
| AM-241 | 0.095 | | 0.074 | 0.076 | 0.067 | pCi/g | 95% | (1.4) | 4/28/08 03:49 p | | 0.5 | ALP125 |
| | | | | | 0.0146 | 1.0 | | (2.5) | | | G | |
| **Batch:** 8101290 | RICHRC5017 | | | **Work Order:** | KK3CE1AA | | **Report DB ID:** | KK3CE1AB | | | | |
| CO-60 | 0.015 | U | 0.034 | 0.034 | 0.0609 | pCi/g | | 0.25 | 4/15/08 10:51 a | | 25.0 | GER8$1 |
| | | | | | | 0.05 | | 0.91 | | | g | |
| CS-137 | -0.014 | U | 0.030 | 0.030 | 0.0498 | pCi/g | | -0.29 | 4/15/08 10:51 a | | 25.0 | GER8$1 |
| | | | | | | 0.1 | | -0.97 | | | g | |
| EU-152 | -0.019 | U | 0.078 | 0.078 | 0.13 | pCi/g | | -0.15 | 4/15/08 10:51 a | | 25.0 | GER8$1 |
| | | | | | | 0.1 | | -0.5 | | | g | |
| EU-154 | 0.049 | U | 0.089 | 0.089 | 0.162 | pCi/g | | 0.3 | 4/15/08 10:51 a | | 25.0 | GER8$1 |
| | | | | | | 0.1 | | (1.1) | | | g | |
| EU-155 | 0.011 | U | 0.053 | 0.053 | 0.0893 | pCi/g | | 0.13 | 4/15/08 10:51 a | | 25.0 | GER8$1 |
| | | | | | | 0.1 | | 0.42 | | | g | |

TestAmerica
rptSTLRchBlank
V5.1.6 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

TESTAMERICA

# FORM II

## BLANK RESULTS

Date: 29-May-08

Lab Name: TestAmerica

Matrix: SOIL

SDG: J00166A

Report No. : 39136

| Parameter | Result | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA , | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

No. of Results: 9 Comments:

TestAmerica MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

rptSTLRchBlank
V5.1.6 A2002

TESTAMERICA

# FORM II

## LCS RESULTS

Date: 29-May-08

Lab Name: TestAmerica

Matrix: SOIL

SDG: J00166A

Report No. : 39136

| Parameter | Result | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA | Report Unit | Yield | Expected | Expected Uncert | Recovery, Bias | Analysis, Prep Date | Aliquot Size | Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch: 8101295 | RICHRC5010 | | | Work Order: | KK3CR1AC | | Report DB ID: | KK3CR1CM | | | | | |
| PU239/40 | 7.2 | | 0.45 | 1.2 | 0.0345 | pCi/g | 91% | 7.3 | 0.25 | 98% | 4/23/08 12:26 p | 1.0 | ALP40 |
| | | | | | | | Rec Limits: | 70 | 130 | 0.0 | | G | |
| Batch: 8128241 | RICHRC5015 | | | Work Order: | KMN3F1AC | | Report DB ID: | KMN3F1CS | | | | | |
| TOTAL-URANIUM | 11.0 | | 0.0000 | 1.2 | 0.263 | ug/g | | 10.0 | 0.31 | 104% | 5/12/08 12:19 p | 0.001 | KPAW3 |
| | | | | | | | Rec Limits: | 70 | 130 | 0.0 | | ML | |
| Batch: 8115217 | RICHRC5080 | | | Work Order: | KLW8A1AC | | Report DB ID: | KLW8A1CS | | | | | |
| AM-241 | 17.0 | | 1.0 | 2.6 | 0.077 | pCi/g | 104% | 19.0 | 0.28 | 88% | 4/28/08 03:49 p | 0.5 | ALP128 |
| | | | | | | | Rec Limits: | 70 | 130 | -0.1 | | G | |
| Batch: 8101290 | RICHRC5017 | | | Work Order: | KK3CE1AC | | Report DB ID: | KK3CE1CS | | | | | |
| CS-137 | 7.7 | | 1.0 | 1.0 | 0.0691 | pCi/g | | 8.0 | 19.0 | 96% | 4/15/08 10:52 a | 25.0 | GER6$1 |
| | | | | | | | Rec Limits: | 70 | 130 | 0.0 | | g | |

No. of Results: 4 Comments:

TestAmerica Bias - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchLcs
V5.1.6 A2002

TESTAMERICA

# FORM II

Date: 29-May-08

## MATRIX SPIKE RESULTS

**Lab Name:** TestAmerica **SDG:** J00166A

**Lot-Sample No.:** J8D090287-1, J16DX8 **Report No. :** 39136 **Matrix:** SOIL

| Parameter | SpikeResult, Orig Rst | Qual | Count Error ( 2 s) | Total Uncert( 2 s) | MDC\|MDA | Rpt Unit, CRDL | Yield | Rec-overy | Exp-ected | Exp Uncert | Analysis, Prep Date | Aliquot Size | Analy Method, Primary Detector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch: 8128241 | Work Order: | KK1CE1AL | | Report DB ID: | KK1CE1LW | | Orig Sa DB ID: | 9KK1CE10 | | | | | |
| TOTAL-URANIUM | 2600.0 | | 0.0000 | 3.1 | 0.255 | ug/g | | !6666.599 | 9.8 | 0.3 | 5/12/08 12:29 p | 0.00103 | RICHRC5015 |
| | 1750.0 | | | | | | | | | | | ML | KPAW3 |

**Number of Results:** 1

**Comments:**

TestAmerica
rptSTLRchMs
V5.1.6 A2002

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
Bias - (Result/Expected)-1 as defined by ANSI N13.30.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

4/24/2008 10:31:35 AM

**Lot No., Due Date:** J8D090287; 04/24/2008

**Client, Site:** 127642; S00N063A00 HANFORD

**QC Batch No., Method Test:** 8101295; RPUISO Pulso by ALP

**SDG, Matrix:** J00166A; SOIL

| | Yes | No | N/A |
|---|---|---|---|
| **1.0 COC** | | | |
| 1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? | ✓ | | |
| **2.0 QC Batch** | | | |
| 2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | ✓ | | |
| 2.2 Are the QC appropriate for the analysis included in the batch? | ✓ | | |
| 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? | ✓ | | |
| 2.4 Does the Worksheets include a Tracer Vial label for each sample? | ✓ | | |
| **3.0 QC & Samples** | | | |
| 3.1 Is the blank results, yield, and MDA within contract limits? | ✓ | | |
| 3.2 Is the LCS result, yield, and MDA within contract limits? | ✓ | | |
| 3.3 Are the MS/MSD results, yields, and MDA within contract limits? | | | ✓ |
| 3.4 Are the duplicate result, yields, and MDAs within contract limits? | ✓ | | |
| 3.5 Are the sample yields and MDAs within contract limits? | ✓ | | |
| **4.0 Raw Data** | | | |
| 4.1 Were results calculated in the correct units? | ✓ | | |
| 4.2 Were analysis volumes entered correctly? | ✓ | | |
| 4.3 Were Yields entered correctly? | ✓ | | |
| 4.4 Were spectra reviewed/meet contractual requirements? | ✓ | | |
| 4.5 Were raw counts reviewed for anomalies? | ✓ | | |
| **5.0 Other** | | | |
| 5.1 Are all nonconformances included and noted? | ✓ | | |
| 5.2 Are all required forms filled out? | ✓ | | |
| 5.3 Was the correct methodology used? | ✓ | | |
| 5.4 Was transcription checked? | ✓ | | |
| 5.5 Were all calculations checked at a minimum frequency? | | | ✓ |
| 5.6 Are worksheet entries complete and correct? | ✓ | | |

6.0 Comments on any No response:
Please see NCM # 10-12181

**First Level Review** [signature] **Date** 4-24-8

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Data Review Checklist

## RADIOCHEMISTRY

### Second Level Review

Batch Number: 8101295

| Review Item | Yes (√) | No (√) | NA (√) |
|---|---|---|---|
| **A. Sample Analysis**<br>1. Are the sample yields within acceptance criteria? | √ | | |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | √ | | |
| 3. Are the correct isotopes reported? | √ | | |
| **B. QC Samples**<br>1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | √ | | |
| 2. Does the blank result meet the Contract criteria? | √ | | |
| 3. Is the blank result < the Contract Detection Limit? | √ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | | | √ |
| 5. Is the LCS recovery within contract acceptance criteria? | √ | | |
| 6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | √ | | |
| 7. Do the MS/MSD results and yields meet acceptance criteria? | | | √ |
| 8. Do the duplicate sample results and yields meet acceptance criteria? | √ | | |
| **C. Other**<br>1. Are all Non-conformances included and noted? | √ | | |
| 2. Are all required forms filled out? | √ | | |
| 3. Was the correct methodology used? | √ | | |
| 4. Was transcription checked? | √ | | |
| 5. Were all calculations checked at a minimum frequency? | √ | | |
| 6. Were units checked? | √ | | |

Comments on any "No" response: See Nar

Second Level Review: Erika Jack Date: 4/24/08

# Clouseau
# Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: **10-12181**
NCM Initiated By: John Norton
Date Opened: 04/24/2008
Date Closed:

Classification: **Anomaly**
Status: **GLREVIEW**
Production Area: Environmental - Sep
Tests: Pulso by ALP
Lot #'s (Sample #'s): J8D090287 (1), J8D100000 (295),
QC Batches: 8101295,

Nonconformance: Other (describe in detail)
Subcategory: Other (explanation required)

## Problem Description / Root Cause

| Name | Date | Description |
|---|---|---|
| John Norton | 04/24/2008 | Significant amounts of uranium noted in these spectra. |

## Corrective Action

| Name | Date | Corrective Action |
|---|---|---|
| John Norton | 04/24/2008 | NA. |

## Client Notification Summary

| Client | Project Manager | Notified | Response | How Notified | Note | Response | Response Note |
|---|---|---|---|---|---|---|---|

## Quality Assurance Verification

| Verified By | Due Date | Status | Notes |
|---|---|---|---|
| | | This section not yet completed by QA. | |

## Approval History

| Date Approved | Approved By | Position |
|---|---|---|

Date Printed: 4/24/2008

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

4/29/2008 8:38:36 AM

**Lot No., Due Date:** J8D090287; 04/24/2008

**Client, Site:** 127642; S00N063A00 HANFORD

**QC Batch No., Method Test:** 8115217; RAMISO Amiso by ALP

**SDG, Matrix:** J00166A; SOIL

| | | | |
|---|---|---|---|
| **1.0 COC** | | | |
| 1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? | Yes ✓ | No | N/A |
| **2.0 QC Batch** | | | |
| 2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | Yes ✓ | No | N/A |
| 2.2 Are the QC appropriate for the analysis included in the batch? | Yes ✓ | No | N/A |
| 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? | Yes ✓ | No | N/A |
| 2.4 Does the Worksheets include a Tracer Vial label for each sample? | Yes ✓ | No | N/A |
| **3.0 QC & Samples** | | | |
| 3.1 Is the blank results, yield, and MDA within contract limits? | Yes | No ✓ | N/A |
| 3.2 Is the LCS result, yield, and MDA within contract limits? | Yes | No ✓ | N/A |
| 3.3 Are the MS/MSD results, yields, and MDA within contract limits? | Yes | No | N/A ✓ |
| 3.4 Are the duplicate result, yields, and MDAs within contract limits? | Yes | No ✓ | N/A |
| 3.5 Are the sample yields and MDAs within contract limits? | Yes | No ✓ | N/A |
| **4.0 Raw Data** | | | |
| 4.1 Were results calculated in the correct units? | Yes ✓ | No | N/A |
| 4.2 Were analysis volumes entered correctly? | Yes ✓ | No | N/A |
| 4.3 Were Yields entered correctly? | Yes | No | N/A ✓ |
| 4.4 Were spectra reviewed/meet contractual requirements? | Yes ✓ | No | N/A |
| 4.5 Were raw counts reviewed for anomalies? | Yes ✓ | No | N/A |
| **5.0 Other** | | | |
| 5.1 Are all nonconformances included and noted? | Yes ✓ | No | N/A |
| 5.2 Are all required forms filled out? | Yes ✓ | No | N/A |
| 5.3 Was the correct methodology used? | Yes ✓ | No | N/A |
| 5.4 Was transcription checked? | Yes ✓ | No | N/A |
| 5.5 Were all calculations checked at a minimum frequency? | Yes ✓ | No | N/A |
| 5.6 Are worksheet entries complete and correct? | Yes ✓ | No | N/A |

6.0 Comments on any No response:
NCM 10-12220

**First Level Review** Lisa Antonson **Date** 4/29/08

TAL Richland
LAS_RADCALCv4.8.33



TESTAMERICA

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Data Review Checklist

## RADIOCHEMISTRY

### Second Level Review

Batch Number: 8115217

| Review Item | Yes (√) | No (√) | NA (√) |
|---|---|---|---|
| A. Sample Analysis<br>1. Are the sample yields within acceptance criteria? | ✓ | | |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | ✓ | | |
| 3. Are the correct isotopes reported? | ✓ | | |
| B. QC Samples<br>1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | ✓ | | |
| 2. Does the blank result meet the Contract criteria? | ✓ | | |
| 3. Is the blank result < the Contract Detection Limit? | ✓ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | | | ✓ |
| 5. Is the LCS recovery within contract acceptance criteria? | ✓ | | |
| 6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | ✓ | | |
| 7. Do the MS/MSD results and yields meet acceptance criteria? | | | ✓ |
| 8. Do the duplicate sample results and yields meet acceptance criteria? | ✓ | | |
| C. Other<br>1. Are all Non-conformances included and noted? | ✓ | | |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Were units checked? | ✓ | | |

Comments on any "No" response: _____

Second Level Review: Jodie G Date: 4/29/08

# Clouseau
# Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | |
|---|---|---|---|
| NCM #: | 10-12220 | | |
| NCM Initiated By: | Lisa Antonson | Classification: | **Anomaly** |
| Date Opened: | 04/29/2008 | Status: | **QAREVIEW** |
| Date Closed: | | Production Area: | Environmental - Sep |
| | | Tests: | AmIso by ALP |
| | | Lot #'s (Sample #'s): | J8D090287 (1), J8D240000 (217), |
| | | QC Batches: | 8115217, |
| Nonconformance: | Other (describe in detail) | | |
| Subcategory: | Other (explanation required) | | |

## Problem Description / Root Cause

| Name | Date | Description |
|---|---|---|
| Lisa Antonson | 04/29/2008 | In the original batch, 8101292, high amounts of Uranium caused interferance. A rerun was prepared, and the samples were run through two Uteva cartridges to remove Uranium from the sample. Samples have good results. |

## Corrective Action

| Name | Date | Corrective Action |
|---|---|---|
| Lisa Antonson | 04/29/2008 | The samples were rerun, removing excess Uranium. |

## Client Notification Summary

| Client | Project Manager | Notified | Response | How Notified | Note |
|---|---|---|---|---|---|
| | Response | Response Note | | | |

## Quality Assurance Verification

| Verified By | Due Date | Status | Notes |
|---|---|---|---|
| | | This section not yet completed by QA. | |

## Approval History

| Date Approved | Approved By | Position |
|---|---|---|

TestAmerica

# Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

4/17/2008 1:52:47 PM

**Lot No., Due Date:** J8D090287; 04/16/2008

**Client, Site:** 127642; S00N063A00 HANFORD

**QC Batch No., Method Test:** 8101290; RGAMMA Gamma by GER

**SDG, Matrix:** J00166A; SOIL

| | Yes | No | N/A |
|---|---|---|---|
| **1.0 COC** | | | |
| 1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? | ✓ | | |
| **2.0 QC Batch** | | | |
| 2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | ✓ | | |
| 2.2 Are the QC appropriate for the analysis included in the batch? | ✓ | | |
| 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? | ✓ | | |
| 2.4 Does the Worksheets include a Tracer Vial label for each sample? | | | ✓ |
| **3.0 QC & Samples** | | | |
| 3.1 Is the blank results, yield, and MDA within contract limits? | ✓ | | |
| 3.2 Is the LCS result, yield, and MDA within contract limits? | ✓ | | |
| 3.3 Are the MS/MSD results, yields, and MDA within contract limits? | | | ✓ |
| 3.4 Are the duplicate result, yields, and MDAs within contract limits? | ✓ | | |
| 3.5 Are the sample yields and MDAs within contract limits? | | ✓ | |
| **4.0 Raw Data** | | | |
| 4.1 Were results calculated in the correct units? | ✓ | | |
| 4.2 Were analysis volumes entered correctly? | ✓ | | |
| 4.3 Were Yields entered correctly? | | | ✓ |
| 4.4 Were spectra reviewed/meet contractual requirements? | ✓ | | |
| 4.5 Were raw counts reviewed for anomalies? | ✓ | | |
| **5.0 Other** | | | |
| 5.1 Are all nonconformances included and noted? | ✓ | | |
| 5.2 Are all required forms filled out? | ✓ | | |
| 5.3 Was the correct methodology used? | ✓ | | |
| 5.4 Was transcription checked? | ✓ | | |
| 5.5 Were all calculations checked at a minimum frequency? | ✓ | | |
| 5.6 Are worksheet entries complete and correct? | ✓ | | |

6.0 Comments on any No response:
NCM 10-12139

First Level Review Tina Anderson Date 4/17/08

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Data Review Checklist

## RADIOCHEMISTRY

### Second Level Review

Batch Number: 8101290

| Review Item | Yes (√) | No (√) | NA (√) |
|---|---|---|---|
| **A. Sample Analysis** 1. Are the sample yields within acceptance criteria? | | | ✓ |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | | ✓ | |
| 3. Are the correct isotopes reported? | ✓ | | |
| **B. QC Samples** 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | ✓ | ✓ | |
| 2. Does the blank result meet the Contract criteria? | ✓ | | |
| 3. Is the blank result < the Contract Detection Limit? | ✓ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | ✓ | ✓ | |
| 5. Is the LCS recovery within contract acceptance criteria? | ✓ | | |
| 6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | ✓ | | |
| 7. Do the MS/MSD results and yields meet acceptance criteria? | | | ✓ |
| 8. Do the duplicate sample results and yields meet acceptance criteria? | | ✓ | |
| **C. Other** 1. Are all Non-conformances included and noted? | ✓ | | |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Were units checked? | ✓ | | |

Comments on any "No" response: See Narr

Second Level Review: Erika Ford Date: 4/17/08

# Clouseau
# Nonconformance Memo

TestAmerica

| | | | |
|---|---|---|---|
| NCM #: | 10-12139 | | |
| NCM Initiated By: | Lisa Antonson | Classification: | **Anomaly** |
| Date Opened: | 04/17/2008 | Status: | **QAREVIEW** |
| Date Closed: | | Production Area: | Environmental - Prep |
| | | Tests: | Gamma by GER |
| | | Lot #'s (Sample #'s): | J8D090287 (1), J8D100000 (290), |
| | | QC Batches: | 8101290, |
| Nonconformance: | Other (describe in detail) | | |
| Subcategory: | Other (explanation required) | | |

## Problem Description / Root Cause

| Name | Date | Description |
|---|---|---|
| Lisa Antonson | 04/17/2008 | The MDAs where not met in this batch due to a combination of not enough sample for the normal 600 g minimum, and high counts in Uranium causing elevated backgroud.<br><br>The dead time also is slightly elevated at 6.7% due to high U content. |

## Corrective Action

| Name | Date | Corrective Action |
|---|---|---|
| Lisa Antonson | 04/17/2008 | NA |

## Client Notification Summary

| Client | Project Manager | Notified | Response | How Notified | Note | Response | Response Note |
|---|---|---|---|---|---|---|---|

## Quality Assurance Verification

| Verified By | Due Date | Status | Notes |
|---|---|---|---|
| | | This section not yet completed by QA. | |

## Approval History

| Date Approved | Approved By | Position |
|---|---|---|

Date Printed: 4/17/2008

TestAmerica

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

5/13/2008 2:55:39 PM

**Lot No., Due Date:** J8D090287; 04/24/2008

**Client, Site:** 127642; S00N063A00 HANFORD

**QC Batch No., Method Test:** 8128241; RUNAT UNat by KPA

**SDG, Matrix:** J00166A; SOIL

| | Yes | No | N/A |
|---|---|---|---|
| **1.0 COC** | | | |
| 1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? | ✓ | | |
| **2.0 QC Batch** | | | |
| 2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | ✓ | | |
| 2.2 Are the QC appropriate for the analysis included in the batch? | ✓ | | |
| 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? | ✓ | | |
| 2.4 Does the Worksheets include a Tracer Vial label for each sample? | | | ✓ |
| **3.0 QC & Samples** | | | |
| 3.1 Is the blank results, yield, and MDA within contract limits? | ✓ | | |
| 3.2 Is the LCS result, yield, and MDA within contract limits? | ✓ | | |
| 3.3 Are the MS/MSD results, yields, and MDA within contract limits? | ✓ | | |
| 3.4 Are the duplicate result, yields, and MDAs within contract limits? | ✓ | | |
| 3.5 Are the sample yields and MDAs within contract limits? | ✓ | | |
| **4.0 Raw Data** | | | |
| 4.1 Were results calculated in the correct units? | ✓ | | |
| 4.2 Were analysis volumes entered correctly? | ✓ | | |
| 4.3 Were Yields entered correctly? | ✓ | | |
| 4.4 Were spectra reviewed/meet contractual requirements? | ✓ | | |
| 4.5 Were raw counts reviewed for anomalies? | ✓ | | |
| **5.0 Other** | | | |
| 5.1 Are all nonconformances included and noted? | ✓ | | |
| 5.2 Are all required forms filled out? | ✓ | | |
| 5.3 Was the correct methodology used? | ✓ | | |
| 5.4 Was transcription checked? | ✓ | | |
| 5.5 Were all calculations checked at a minimum frequency? | | | ✓ |
| 5.6 Are worksheet entries complete and correct? | ✓ | | |

6.0 Comments on any No response:
Please see NCM # 10-12323

**First Level Review** [signature] **Date** 5-13-8

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Data Review Checklist

## RADIOCHEMISTRY

### Second Level Review

Batch Number: 812 8241

| Review Item | Yes (√) | No (√) | NA (√) |
|---|---|---|---|
| **A. Sample Analysis**<br>1. Are the sample yields within acceptance criteria? | | | ✓ |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | | ✓ | |
| 3. Are the correct isotopes reported? | ✓ | | |
| **B. QC Samples**<br>1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | ✓ | | |
| 2. Does the blank result meet the Contract criteria? | ✓ | | |
| 3. Is the blank result < the Contract Detection Limit? | ✓ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | QA 05-14-08 | | ✓ |
| 5. Is the LCS recovery within contract acceptance criteria? | ✓ | | |
| 6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | ✓ | | |
| 7. Do the MS/MSD results and yields meet acceptance criteria? | ✓ | | |
| 8. Do the duplicate sample results and yields meet acceptance criteria? | ✓ | | |
| **C. Other**<br>1. Are all Non-conformances included and noted? | ✓ | | |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Were units checked? | ✓ | | |

Comments on any "No" response: Sample diluted to 0.1 ml
High Uranium suspected.
C-NCM / Blue sheet
Fv.- Details!

Second Level Review: R Petty Date: 05-14-08

# Clouseau
# Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: 10-12323
NCM Initiated By: John Norton
Date Opened: 05/13/2008
Date Closed:

Classification: **Anomaly**
Status: **GLREVIEW**
Production Area: Environmental - Prep
Tests: UNat by KPA
Lot #'s (Sample #'s): J8D090287 (1), J8E070000 (241),
QC Batches: 8128241,

Nonconformance: Other (describe in detail)
Subcategory: Other (explanation required)

## Problem Description / Root Cause

| Name | Date | Description |
|---|---|---|
| John Norton | 05/13/2008 | Due to the relatively high amounts of uranium believed to be in this sample a one gram aliquot was taken, leached and diluted to 100 ml, one ml of this dilution was then taken and again diluted by 100 ml, 1 ml was again taken and diluted to 100 ml of which 0.1 ml was analyzed (see blue sheet). |

## Corrective Action

| Name | Date | Corrective Action |
|---|---|---|
| John Norton | 05/13/2008 | These repeated dilutions may have introduced greater error into the calculation that is usual. |

## Client Notification Summary

| Client | Project Manager | Notified | Response | How Notified | Note |
|---|---|---|---|---|---|
| | Response | Response Note | | | |

## Quality Assurance Verification

| Verified By | Due Date | Status | Notes |
|---|---|---|---|
| | | This section not yet completed by QA. | |

## Approval History

| Date Approved | Approved By | Position |
|---|---|---|

Date Printed: 5/13/2008

TESTAMERICA

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-059 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B Lawrence, E. Harries | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Price Code | Data Turnaround<br>**24 Hours** | | |
| Project Designation<br>618-7 Burial Ground - Soil | Sampling Location<br>618-7 Burial Ground/Stockpiles | | SAF No.<br>RC-087 |
| Ice Chest No.<br>FRC-99-051 | Field Logbook No.<br>EL-1395-12 | COA<br>RG61872600 | Method of Shipment<br>Government Vehicle |
| Shipped To<br>TestAmerica Incorporated, Richland | Offsite Property No.<br>N/A | | Bill of Lading/Air Bill No.<br>N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | TIE +7 DCF | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J16DX8 KKNG6 | SOIL | 3-28-08 | 0915 | X | | | | | | | | J16DW8 | | AN-01 |
| J16DX9 KKNG7 | SOIL | 3-28-08 | 0925 | X | | | | | | | | J16DW9 | | AN-02 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From<br>B Lawrence | Date/Time 1100<br>3-28-08 | Received By/Stored In<br>RB Kerkow / RB Kerk | Date/Time 1100<br>3-28-08 |
| Relinquished By/Removed From<br>RB Kerkow / RB Kerk | Date/Time 1230<br>3-28-08 | Received By/Stored In<br>REP 1B (RBK) | Date/Time 1230<br>3-28-08 |
| Relinquished By/Removed From<br>1060 BATELLE 1B | Date/Time 4/3/08 0900 | Received By/Stored In<br>DAVID ST. JOHN | Date/Time 4/3/08 0900 |
| Relinquished By/Removed From<br>DAVID ST. JOHN | Date/Time 4/3/08 1030 | Received By/Stored In<br>LJ LANE TALR 4308 | Date/Time 1030 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}: Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

J8D030231
J00166
DUE 4-4-08
J1DX8 - Client Requested gamma, U ISO, Pu ISO & Am241 on 4/9/08

Matrix *

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
Li=Liquid
Ve=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | 7 day TAT on gamma (count gamma) then analyze U ISO, Pu ISO & Am241 (15 day TAT FROM STARTED OF analysis. SKS 4/9/08 |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

J8D090287 ~~J00168~~ SKS 4/16/08
J00166A

**Radiological Counting Facility**

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19364 |
| Sample Description | : J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 4.800E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 9:15:00AM |
| Acquisition Started | : 3/31/2008 11:31:15AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3716.2 seconds |
| Dead Time | : 3.13 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/4/2008 |
| Efficiency Calibration Description | : 50ml Pill Box (1234-95-2) 2/4/2008 |
| Sample Number | : 18288 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.991 | 1.97E+02 | 1.83E+01 | |
| U-235 | | 0.981 | 2.70E+03 | 8.44E+01 | |
| U-238d | e | 0.986 | 2.43E+04 | 1.42E+03 | |

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium

Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 12:33:14PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 1 | 52.88 | NP | 3.28E+00 | 5.93 |
| | 3 | 83.70 | NP | 2.08E+01 | 1.37 |
| m | 5 | 94.21 | Th-234 | 1.32E+02 | 0.18 |
| m | 6 | 97.98 | NP | 1.47E+02 | 0.14 |
| M | 7 | 110.60 | ~~Th-234~~ Pa-234 | 5.12E+01 | 0.48 |
| m | 8 | 112.36 | Th-234 | 3.43E+01 | 0.71 |
| m | 9 | 114.25 | NP | 2.86E+01 | 0.68 |
| | 10 | 120.37 | NP | 2.63E-01 | 60.48 |
| | 11 | 130.96 | NP | 1.65E+00 | 15.95 |
| | 15 | 194.56 | NP | 1.41E+00 | 9.24 |
| M | 16 | 201.62 | NP | 1.90E+00 | 2.89 |
| M | 18 | 221.07 | NP | 2.30E-01 | 18.19 |
| m | 19 | 226.59 | NP | 7.55E-01 | 6.82 |
| | 20 | 257.77 | NP | 4.37E+00 | 2.25 |
| | 21 | 387.32 | NP | 2.18E-01 | 29.11 |
| | 22 | 568.87 | NP | 6.39E-01 | 9.33 |
| | 23 | 690.59 | NP | 2.92E-01 | 17.57 |
| M | 24 | 701.36 | NP | 2.19E-01 | 9.52 |
| m | 25 | 705.58 | NP | 2.56E-01 | 8.75 |
| | 26 | 733.17 | NP | 2.95E-01 | 16.36 |
| | 27 | 742.56 | NP | 2.91E+00 | 2.09 |
| | 28 | 766.13 | NP | 1.01E+01 | 0.77 |
| | 29 | 786.07 | Bi-214 | 1.36E+00 | 4.17 |
| | 30 | 805.60 | Bi-214 | 3.41E-01 | 12.95 |
| M | 31 | 824.65 | NP | 1.57E-01 | 9.99 |
| m | 32 | 831.37 | NP | 1.47E-01 | 10.48 |
| | 33 | 851.13 | NP | 1.59E-01 | 22.05 |
| M | 34 | 880.40 | NP | 4.22E-01 | 4.37 |
| m | 35 | 883.04 | NP | 5.57E-01 | 3.29 |
| m | 36 | 886.97 | NP | 1.90E-01 | 7.14 |
| M | 37 | 921.48 | NP | 2.70E-01 | 6.11 |
| m | 38 | 925.97 | NP | 8.05E-01 | 2.44 |
| | 39 | 945.67 | NP | 9.09E-01 | 3.44 |
| | 40 | 1000.70 | Pa-234M | 2.28E+01 | 0.39 |
| | 41 | 1043.73 | NP | 7.98E-02 | 23.52 |
| | 42 | 1124.69 | NP | 1.20E-01 | 14.97 |
| | 43 | 1193.34 | NP | 3.16E-01 | 5.98 |
| | 44 | 1236.93 | NP | 1.42E-01 | 11.64 |
| | 45 | 1393.41 | NP | 7.93E-02 | 15.58 |
| | 46 | 1413.72 | NP | 2.55E-02 | 38.32 |
| | 47 | 1433.82 | NP | 1.95E-01 | 6.78 |

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 49 | 1510.08 | NP | 2.47E-01 | 5.56 |
| | 50 | 1527.09 | NP | 4.35E-02 | 23.97 |
| | 51 | 1553.76 | NP | 1.07E-01 | 11.30 |
| | 52 | 1737.74 | NP | 3.84E-01 | 3.19 |
| | 53 | 1765.62 | NP | 1.10E-01 | 8.25 |
| M | 54 | 1809.38 | NP | 5.77E-02 | 6.88 |
| m | 55 | 1820.25 | NP | 1.25E-02 | 18.57 |
| | 56 | 1831.45 | NP | 2.84E-01 | 3.79 |
| M | 57 | 1867.95 | NP | 1.61E-01 | 3.92 |
| m | 58 | 1875.50 | NP | 1.45E-01 | 4.11 |
| | 59 | 1893.95 | NP | 4.22E-02 | 11.36 |
| | 60 | 1911.41 | NP | 9.37E-02 | 6.55 |
| | 61 | 1937.33 | NP | 5.78E-02 | 7.91 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

# NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.97E+02 | 2.11E+01 | 2.11E+01 |
| | CO-60 | 1173.24 | | 99.90 | 1.75E-01 | 2.10E+00 | 2.48E+00 |
| | | 1332.50 | | 99.98 | 6.03E-01 | | 2.10E+00 |
| | NB-94 | 702.63 | | 99.81 | -4.07E-01 | 4.00E+00 | 4.82E+00 |
| | | 871.10 | | 99.89 | -6.27E+00 | | 4.00E+00 |
| | AG-108m | 433.94 | | 90.50 | 3.23E+00 | 4.32E+00 | 4.32E+00 |
| | | 614.28 | | 89.80 | 2.55E+00 | | 4.64E+00 |
| | | 722.94 | | 90.80 | -2.11E+00 | | 4.96E+00 |
| | CS-137 | 661.66 | | 85.21 | -3.37E+00 | 4.94E+00 | 4.94E+00 |
| | EU-152 | 40.12 | | 38.40 | -9.17E+00 | 9.83E+00 | 1.03E+01 |
| | | 45.38 | | 11.10 | -6.27E+01 | | 3.13E+01 |
| | | 121.78 | | 28.40 | -1.13E+00 | | 1.18E+01 |
| | | 244.69 | | 7.51 | -6.50E+01 | | 4.89E+01 |
| | | 344.29 | | 26.60 | 9.54E+00 | | 1.39E+01 |
| | | 411.12 | | 2.23 | -1.95E+00 | | 1.65E+02 |
| | | 443.89 | | 2.80 | -4.08E+01 | | 1.40E+02 |
| | | 778.92 | | 12.98 | -3.57E+01 | | 3.94E+01 |
| | | 867.38 | | 4.21 | 2.37E+00 | | 9.44E+01 |
| | | 964.11 | | 14.50 | 9.88E+00 | | 2.20E+01 |
| | | 1085.89 | | 9.94 | 4.20E+00 | | 2.79E+01 |

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 1089.71 | | 1.71 | -5.53E+01 | | 1.61E+02 |
| | | 1112.07 | | 13.60 | -2.94E+00 | | 1.91E+01 |
| | | 1212.93 | | 1.40 | -1.54E+02 | | 1.77E+02 |
| | | 1299.16 | | 1.63 | -1.46E+02 | | 1.33E+02 |
| | | 1408.00 | | 20.80 | -5.20E+00 | | 9.83E+00 |
| | EU-154 | 123.10 | | 40.50 | -5.11E-01 | 6.29E+00 | 8.21E+00 |
| | | 723.36 | | 19.70 | -9.71E+00 | | 2.29E+01 |
| | | 873.23 | | 11.45 | -4.96E+01 | | 3.51E+01 |
| | | 1004.78 | | 17.90 | -4.02E+02 | | 8.72E+01 |
| | | 1274.54 | | 35.50 | 1.04E-02 | | 6.29E+00 |
| | EU-155 | 86.54 | | 34.00 | -4.16E+02 | 1.77E+01 | 1.77E+01 |
| | | 105.31 | | 20.60 | -7.03E+02 | | 2.42E+01 |
| | PB-212 | 74.81 | | 10.50 | 7.34E+01 | 2.88E+01 | 4.02E+01 |
| | | 77.11 | | 17.70 | -2.59E+02 | | 2.88E+01 |
| | | 87.19 | | 6.27 | -2.25E+03 | | 9.76E+01 |
| | RA-226d | 186.11 | | 3.28 | -4.08E+01 | 9.00E+00 | 3.56E+02 |
| | | 241.92 | | 7.46 | -6.93E+00 | | 4.93E+01 |
| | | 295.09 | | 19.20 | 1.78E+01 | | 1.88E+01 |
| | | 351.87 | | 37.10 | -5.96E+00 | | 9.90E+00 |
| | | 609.31 | | 46.10 | 3.18E+00 | | 9.00E+00 |
| | | 1120.27 | | 15.00 | 2.10E+00 | | 1.85E+01 |
| | | 1764.49 | | 15.90 | 6.76E+01 | | 1.49E+01 |
| | TH-232d | 238.58 | | 43.60 | 7.03E+00 | 8.47E+00 | 8.47E+00 |
| | | 338.42 | | 12.40 | 1.09E+01 | | 2.97E+01 |
| | | 583.02 | | 30.87 | 1.97E+00 | | 1.35E+01 |
| | | 911.16 | | 29.00 | -8.06E+00 | | 1.18E+01 |
| | | 968.97 | | 17.40 | -4.58E+00 | | 1.83E+01 |
| + | U-235 | 143.79 | * | 10.50 | 1.97E+03 | 1.28E+01 | 4.07E+01 |
| | | 163.38 | * | 4.70 | 2.78E+03 | | 9.79E+01 |
| | | 185.74 | * | 53.00 | 3.10E+03 | | 1.28E+01 |
| | | 205.33 | * | 4.70 | 3.47E+03 | | 9.21E+01 |
| + | U-238d | 63.29 | * | 3.80 | 2.43E+04 | 9.84E+01 | 1.47E+02 |
| | | 92.56 | * | 5.41 | 4.28E+04 | | 9.84E+01 |
| | AM-241 | 59.54 | | 35.70 | -1.68E+02 | 1.10E+01 | 1.10E+01 |
| | CM-243 | 99.52 | | 14.40 | -6.02E+01 | 2.23E+01 | 5.88E+01 |
| | | 103.73 | | 23.00 | -7.83E+02 | | 2.23E+01 |
| | | 116.93 | | 8.32 | -2.53E+01 | | 5.46E+01 |
| | | 228.19 | | 10.56 | -7.34E+00 | | 3.58E+01 |
| | | 277.60 | | 14.00 | 4.45E+01 | | 2.62E+01 |
| | CM-245 | 99.52 | | 21.10 | -4.11E+01 | 1.53E+01 | 4.01E+01 |
| | | 103.73 | | 33.60 | -5.36E+02 | | 1.53E+01 |
| | | 116.93 | | 12.20 | -1.73E+01 | | 3.72E+01 |
| | | 174.94 | | 9.50 | 5.76E+00 | | 4.16E+01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

Reviewed and Approved: Edward S. Wallace, Edward S Wallace 4-02-08
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19365 |
| Sample Description | : J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 4.300E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 9:25:00AM |
| Acquisition Started | : 3/31/2008 11:31:07AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3662.9 seconds |
| Dead Time | : 1.72 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 50g Pill Box 1-10-2008 |
| Sample Number | : 18287 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.993 | 1.54E+01 | 3.45E+00 | |
| PB-212 | | 0.709 | 8.25E-01 | 1.84E-01 | |
| RA-226d | | 0.671 | 3.19E-01 | 1.65E-01 | |
| TH-232d | | 0.850 | 6.67E-01 | 1.86E-01 | |
| U-235 | | 0.547 | 6.08E-01 | 1.73E-01 | |
| U-238d | @ | 1.000 | 8.52E+00 | 2.02E+00 | |

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 12:32:24PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
NP = No Peak
UK = Unknown
Errors quoted at 2.000 sigma

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.54E+01 | 3.26E+00 | 3.26E+00 |
| | CO-60 | 1173.24 | | 99.90 | -6.34E-02 | 3.47E-01 | 3.47E-01 |
| | | 1332.50 | | 99.98 | 3.75E-02 | | 3.60E-01 |
| | NB-94 | 702.63 | | 99.81 | 7.05E-02 | 2.58E-01 | 2.58E-01 |
| | | 871.10 | | 99.89 | 1.41E-02 | | 2.63E-01 |
| | AG-108m | 433.94 | | 90.50 | 1.28E-01 | 2.28E-01 | 2.28E-01 |
| | | 614.28 | | 89.80 | -1.16E-01 | | 3.23E-01 |
| | | 722.94 | | 90.80 | 1.29E-01 | | 2.82E-01 |
| | CS-137 | 661.66 | | 85.21 | 3.89E-02 | 3.02E-01 | 3.02E-01 |
| | EU-152 | 40.12 | | 38.40 | 7.17E-03 | 3.96E-01 | 3.96E-01 |
| | | 45.38 | | 11.10 | 3.69E-01 | | 1.26E+00 |
| | | 121.78 | | 28.40 | 1.98E-01 | | 4.43E-01 |
| | | 244.69 | | 7.51 | -2.24E+00 | | 2.30E+00 |
| | | 344.29 | | 26.60 | -2.47E-01 | | 7.72E-01 |
| | | 411.12 | | 2.23 | 3.66E+00 | | 9.37E+00 |
| | | 443.89 | | 2.80 | -4.69E+00 | | 6.69E+00 |
| | | 778.92 | | 12.98 | 1.69E-01 | | 1.93E+00 |
| | | 867.38 | | 4.21 | 4.44E+00 | | 7.05E+00 |

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | -1.96E-01 | | 2.38E+00 |
| | | 1085.89 | | 9.94 | -1.35E+00 | | 3.24E+00 |
| | | 1089.71 | | 1.71 | -4.04E+00 | | 1.97E+01 |
| | | 1112.07 | | 13.60 | -1.25E+00 | | 2.56E+00 |
| | | 1212.93 | | 1.40 | -1.72E+01 | | 2.31E+01 |
| | | 1299.16 | | 1.63 | 1.26E+01 | | 2.33E+01 |
| | | 1408.00 | | 20.80 | 8.27E-02 | | 1.62E+00 |
| | EU-154 | 123.10 | | 40.50 | 3.69E-02 | 3.07E-01 | 3.07E-01 |
| | | 723.36 | | 19.70 | 3.13E-01 | | 1.29E+00 |
| | | 873.23 | | 11.45 | -1.14E+00 | | 2.36E+00 |
| | | 1004.78 | | 17.90 | 1.55E+00 | | 1.81E+00 |
| | | 1274.54 | | 35.50 | 4.97E-01 | | 1.02E+00 |
| | EU-155 | 86.54 | | 34.00 | -5.02E-02 | 4.17E-01 | 4.17E-01 |
| | | 105.31 | | 20.60 | 2.65E-01 | | 6.12E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.17E+00 | 4.12E-01 | 7.22E-01 |
| | | 77.11 | * | 17.70 | 7.21E-01 | | 4.12E-01 |
| | | 87.19 | | 6.27 | 6.20E-02 | | 2.35E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 1.01E+01 | 3.68E-01 | 3.82E+00 |
| | | 241.92 | | 7.46 | -9.30E-01 | | 3.00E+00 |
| | | 295.09 | * | 19.20 | 5.92E-01 | | 6.49E-01 |
| | | 351.87 | * | 37.10 | 3.03E-01 | | 3.68E-01 |
| | | 609.31 | * | 46.10 | 2.24E-01 | | 4.52E-01 |
| | | 1120.27 | | 15.00 | 9.26E-01 | | 2.51E+00 |
| | | 1764.49 | | 15.90 | 1.11E+00 | | 2.38E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 5.99E-01 | 3.54E-01 | 3.54E-01 |
| | | 338.42 | * | 12.40 | 5.99E-01 | | 9.72E-01 |
| | | 583.02 | * | 30.87 | 8.64E-01 | | 5.68E-01 |
| | | 911.16 | * | 29.00 | 7.32E-01 | | 8.91E-01 |
| | | 968.97 | | 17.40 | 1.63E+00 | | 1.97E+00 |
| + | U-235 | 143.79 | | 10.50 | 9.67E-01 | 2.37E-01 | 1.34E+00 |
| | | 163.38 | | 4.70 | 5.41E-02 | | 2.95E+00 |
| | | 185.74 | * | 53.00 | 6.28E-01 | | 2.37E-01 |
| | | 205.33 | | 4.70 | 6.04E-02 | | 3.52E+00 |
| + | U-238d | 63.29 | * | 3.80 | 8.52E+00 | 2.10E+00 | 2.72E+00 |
| | | 92.56 | * | 5.41 | 1.05E+01 | | 2.10E+00 |
| | AM-241 | 59.54 | | 35.70 | -7.91E-02 | 4.35E-01 | 4.35E-01 |
| | CM-243 | 99.52 | | 14.40 | -6.09E-01 | 5.40E-01 | 8.73E-01 |
| | | 103.73 | | 23.00 | -4.32E-01 | | 5.40E-01 |
| | | 116.93 | | 8.32 | -1.89E-01 | | 1.52E+00 |
| | | 228.19 | | 10.56 | -8.73E-02 | | 1.51E+00 |
| | | 277.60 | | 14.00 | -1.06E+00 | | 1.15E+00 |
| | CM-245 | 99.52 | | 21.10 | -4.16E-01 | 3.70E-01 | 5.95E-01 |
| | | 103.73 | | 33.60 | -2.96E-01 | | 3.70E-01 |
| | | 116.93 | | 12.20 | -1.29E-01 | | 1.03E+00 |
| | | 174.94 | | 9.50 | 7.00E-01 | | 1.49E+00 |

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
• = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: Edward S. Wallace Edward S Wallace 4-02-08
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19362 |
| Sample Description | : J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.600E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 10:05:00AM |
| Acquisition Started | : 3/31/2008 10:21:24AM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3662.3 seconds |
| Dead Time | : 1.70 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18283 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.989 | 1.26E+01 | 2.56E+00 | |
| CS-137 | | 0.990 | 5.17E-01 | 1.42E-01 | |
| PB-212 | | 0.707 | 1.15E+00 | 2.32E-01 | |
| RA-226d | | 0.786 | 3.96E-01 | 1.43E-01 | |
| TH-232d | | 0.751 | 6.04E-01 | 1.89E-01 | |
| U-235 | | 0.999 | 2.92E+00 | 4.68E-01 | |
| U-238d | @ | 1.000 | 5.61E+01 | 4.74E+00 | |

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 11:22:29AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|
| M | 4 | 84.05 NP | 6.23E-02 | 9.71 |
| m | 5 | 89.94 NP | 3.91E-02 | 13.29 |
| m | 7 | 98.34 NP | 4.27E-02 | 10.87 |
| | 8 | 112.73 NP | 4.41E-02 | 20.15 |
| | 21 | 1000.59 Pa-234m | 2.00E-02 | 15.11 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.26E+01 | 2.25E+00 | 2.25E+00 |
| | CO-60 | 1173.24 | | 99.90 | -2.45E-02 | 1.96E-01 | 2.59E-01 |
| | | 1332.50 | | 99.98 | -1.00E-01 | | 1.96E-01 |
| | NB-94 | 702.63 | | 99.81 | 1.32E-01 | 2.09E-01 | 2.09E-01 |
| | | 871.10 | | 99.89 | 1.37E-01 | | 2.22E-01 |
| | AG-108m | 433.94 | | 90.50 | 7.27E-02 | 1.70E-01 | 1.70E-01 |
| | | 614.28 | | 89.80 | -2.75E-01 | | 2.59E-01 |
| | | 722.94 | | 90.80 | 6.49E-02 | | 2.21E-01 |
| + | CS-137 | 661.66 | * | 85.21 | 5.17E-01 | 1.65E-01 | 1.65E-01 |
| | EU-152 | 40.12 | | 38.40 | 7.23E-02 | 3.39E-01 | 3.39E-01 |
| | | 45.38 | | 11.10 | -1.24E-01 | | 1.23E+00 |
| | | 121.78 | | 28.40 | 1.68E-01 | | 4.18E-01 |
| | | 244.69 | | 7.51 | -2.12E+00 | | 1.72E+00 |
| | | 344.29 | | 26.60 | 3.21E-01 | | 5.91E-01 |

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 411.12 | | 2.23 | 2.59E+00 | | 6.95E+00 |
| | | 443.89 | | 2.80 | -6.41E-01 | | 5.54E+00 |
| | | 778.92 | | 12.98 | -6.42E-01 | | 1.31E+00 |
| | | 867.38 | | 4.21 | -2.91E-01 | | 5.41E+00 |
| | | 964.11 | | 14.50 | -3.82E-01 | | 1.96E+00 |
| | | 1085.89 | | 9.94 | -3.39E-01 | | 2.52E+00 |
| | | 1089.71 | | 1.71 | 1.54E+00 | | 1.44E+01 |
| | | 1112.07 | | 13.60 | -2.31E+00 | | 1.91E+00 |
| | | 1212.93 | | 1.40 | 1.41E+00 | | 1.87E+01 |
| | | 1299.16 | | 1.63 | 5.64E+00 | | 1.42E+01 |
| | | 1408.00 | | 20.80 | 4.41E-01 | | 8.51E-01 |
| | EU-154 | 123.10 | | 40.50 | 2.87E-01 | 2.96E-01 | 2.96E-01 |
| | | 723.36 | | 19.70 | 2.92E-01 | | 1.02E+00 |
| | | 873.23 | | 11.45 | 1.02E+00 | | 1.94E+00 |
| | | 1004.78 | | 17.90 | 3.21E+00 | | 1.99E+00 |
| | | 1274.54 | | 35.50 | -1.02E-01 | | 6.84E-01 |
| | EU-155 | 86.54 | | 34.00 | -8.75E+00 | 5.73E-01 | 5.73E-01 |
| | | 105.31 | | 20.60 | -4.12E-01 | | 6.23E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.48E+00 | 5.78E-01 | 9.91E-01 |
| | | 77.11 | * | 17.70 | 1.03E+00 | | 5.78E-01 |
| | | 87.19 | | 6.27 | -1.16E+02 | | 3.26E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 5.35E+01 | 3.17E-01 | 3.59E+00 |
| | | 241.92 | | 7.46 | -3.96E-01 | | 2.33E+00 |
| | | 295.09 | * | 19.20 | 5.83E-01 | | 4.82E-01 |
| | | 351.87 | * | 37.10 | 3.08E-01 | | 3.28E-01 |
| | | 609.31 | * | 46.10 | 3.69E-01 | | 3.17E-01 |
| | | 1120.27 | * | 15.00 | 7.87E-01 | | 9.38E-01 |
| | | 1764.49 | | 15.90 | 9.85E-02 | | 1.12E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 6.43E-01 | 2.16E-01 | 2.16E-01 |
| | | 338.42 | * | 12.40 | 5.79E-01 | | 8.81E-01 |
| | | 583.02 | * | 30.87 | 5.39E-01 | | 3.96E-01 |
| | | 911.16 | | 29.00 | 4.58E-01 | | 9.05E-01 |
| | | 968.97 | * | 17.40 | 8.12E-01 | | 9.56E-01 |
| + | U-235 | 143.79 | * | 10.50 | 2.86E+00 | 2.22E-01 | 9.08E-01 |
| | | 163.38 | * | 4.70 | 3.94E+00 | | 2.58E+00 |
| | | 185.74 | * | 53.00 | 3.31E+00 | | 2.22E-01 |
| | | 205.33 | * | 4.70 | 1.35E+00 | | 2.21E+00 |
| + | U-238d | 63.29 | * | 3.80 | 5.61E+01 | 1.71E+00 | 3.94E+00 |
| | | 92.56 | * | 5.41 | 5.14E+01 | | 1.71E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.99E-01 | 7.25E-01 | 7.25E-01 |
| | CM-243 | 99.52 | | 14.40 | -5.68E-01 | 5.46E-01 | 9.95E-01 |
| | | 103.73 | | 23.00 | -1.30E+00 | | 5.46E-01 |
| | | 116.93 | | 8.32 | -7.67E-01 | | 1.64E+00 |
| | | 228.19 | | 10.56 | 4.11E-02 | | 1.16E+00 |
| | | 277.60 | | 14.00 | 1.46E-01 | | 8.95E-01 |
| | CM-245 | 99.52 | | 21.10 | -3.88E-01 | 3.74E-01 | 6.79E-01 |
| | | 103.73 | | 33.60 | -8.87E-01 | | 3.74E-01 |
| | | 116.93 | | 12.20 | -5.23E-01 | | 1.12E+00 |

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|
| | 174.94 | 9.50 | 3.62E-01 | | 1.35E+00 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: Edward S. Wallace, Edward S Wallace 4-02-08
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19363 |
| Sample Description | : J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 7.400E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 10:10:00AM |
| Acquisition Started | : 3/31/2008 10:21:33AM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.8 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/5/2008 |
| Efficiency Calibration Description | : 80g Pill box 2/5/2008 |
| Sample Number | : 18284 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.999 | 1.29E+01 | 3.63E+00 | |
| CS-137 | | 0.998 | 6.92E-01 | 1.73E-01 | |
| PB-212 | | 0.707 | 1.02E+00 | 2.24E-01 | |
| RA-226d | | 0.404 | 2.97E-01 | 1.51E-01 | |
| TH-232d | | 0.996 | 4.59E-01 | 1.42E-01 | |
| U-235 | | 0.999 | 3.29E+00 | 5.85E-01 | |
| U-238d | @ | 1.000 | 4.35E+01 | 5.24E+00 | |

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 11:21:43AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 4 | 84.37 | Th-231 | 7.33E-02 | 18.72 |
| M | 5 | 89.95 | Ac-228 | 3.38E-02 | 17.31 |
| | 7 | 98.45 | Pa-234 | 3.75E-02 | 31.93 |
| M | 8 | 109.39 | NP | 1.26E-02 | 35.06 |
| m | 9 | 112.61 | NP | 5.65E-02 | 11.05 |
| | 20 | 766.63 | NP | 1.24E-02 | 26.69 |
| | 23 | 1001.17 | Pa-234m | 1.78E-02 | 18.66 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.29E+01 | 2.04E+00 | 2.04E+00 |
| | CO-60 | 1173.24 | | 99.90 | -3.80E-02 | 1.70E-01 | 2.01E-01 |
| | | 1332.50 | | 99.98 | -2.58E-02 | | 1.70E-01 |
| | NB-94 | 702.63 | | 99.81 | 1.11E-01 | 1.59E-01 | 1.79E-01 |
| | | 871.10 | | 99.89 | -3.47E-02 | | 1.59E-01 |
| | AG-108m | 433.94 | | 90.50 | -8.21E-03 | 1.39E-01 | 1.39E-01 |
| | | 614.28 | | 89.80 | 5.82E-02 | | 1.83E-01 |
| | | 722.94 | | 90.80 | 4.28E-02 | | 2.03E-01 |
| + | CS-137 | 661.66 | * | 85.21 | 6.92E-01 | 2.03E-01 | 2.03E-01 |
| | EU-152 | 40.12 | | 38.40 | -2.01E-01 | 3.49E-01 | 3.49E-01 |
| | | 45.38 | | 11.10 | -4.89E-01 | | 1.20E+00 |
| | | 121.78 | | 28.40 | 2.77E-01 | | 3.69E-01 |

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 244.69 | | 7.51 | 3.10E-01 | | 1.39E+00 |
| | | 344.29 | | 26.60 | -6.96E-02 | | 4.06E-01 |
| | | 411.12 | | 2.23 | -9.82E-02 | | 5.16E+00 |
| | | 443.89 | | 2.80 | -2.26E+00 | | 4.29E+00 |
| | | 778.92 | | 12.98 | -1.43E+00 | | 1.24E+00 |
| | | 867.38 | | 4.21 | -1.44E+00 | | 3.71E+00 |
| | | 964.11 | | 14.50 | -9.50E-01 | | 1.65E+00 |
| | | 1085.89 | | 9.94 | 1.11E+00 | | 2.11E+00 |
| | | 1089.71 | | 1.71 | 1.01E-01 | | 1.13E+01 |
| | | 1112.07 | | 13.60 | -3.86E-01 | | 1.53E+00 |
| | | 1212.93 | | 1.40 | -1.99E-01 | | 1.53E+01 |
| | | 1299.16 | | 1.63 | 4.90E+00 | | 1.27E+01 |
| | | 1408.00 | | 20.80 | 1.42E-01 | | 8.52E-01 |
| | EU-154 | 123.10 | | 40.50 | 1.46E-03 | 2.54E-01 | 2.54E-01 |
| | | 723.36 | | 19.70 | 1.97E-01 | | 9.39E-01 |
| | | 873.23 | | 11.45 | -6.27E-01 | | 1.36E+00 |
| | | 1004.78 | | 17.90 | -1.17E-02 | | 1.68E+00 |
| | | 1274.54 | | 35.50 | -5.78E-02 | | 5.49E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.54E-02 | 4.89E-01 | 4.89E-01 |
| | | 105.31 | | 20.60 | 1.81E-01 | | 5.32E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.26E+00 | 6.84E-01 | 1.14E+00 |
| | | 77.11 | * | 17.70 | 9.24E-01 | | 6.84E-01 |
| | | 87.19 | | 6.27 | -8.33E-02 | | 2.70E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 5.28E+01 | 3.16E-01 | 3.25E+00 |
| | | 241.92 | | 7.46 | 7.83E-01 | | 1.99E+00 |
| | | 295.09 | | 19.20 | 2.39E-01 | | 5.57E-01 |
| | | 351.87 | * | 37.10 | 2.75E-01 | | 3.16E-01 |
| | | 609.31 | * | 46.10 | 3.19E-01 | | 3.24E-01 |
| | | 1120.27 | | 15.00 | 7.37E-01 | | 1.53E+00 |
| | | 1764.49 | | 15.90 | 1.03E+00 | | 1.43E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 4.41E-01 | 2.83E-01 | 2.83E-01 |
| | | 338.42 | * | 12.40 | 4.26E-01 | | 8.74E-01 |
| | | 583.02 | * | 30.87 | 4.39E-01 | | 3.53E-01 |
| | | 911.16 | * | 29.00 | 4.44E-01 | | 5.83E-01 |
| | | 968.97 | * | 17.40 | 7.09E-01 | | 8.04E-01 |
| + | U-235 | 143.79 | * | 10.50 | 3.08E+00 | 2.01E-01 | 9.77E-01 |
| | | 163.38 | * | 4.70 | 3.37E+00 | | 2.40E+00 |
| | | 185.74 | * | 53.00 | 3.27E+00 | | 2.01E-01 |
| | | 205.33 | * | 4.70 | 4.13E+00 | | 1.96E+00 |
| + | U-238d | 63.29 | * | 3.80 | 4.35E+01 | 2.41E+00 | 4.23E+00 |
| | | 92.56 | * | 5.41 | 4.46E+01 | | 2.41E+00 |
| | AM-241 | 59.54 | | 35.70 | -3.69E-02 | 3.89E-01 | 3.89E-01 |
| | CM-243 | 99.52 | | 14.40 | -6.07E-02 | 4.70E-01 | 9.28E-01 |
| | | 103.73 | | 23.00 | -1.46E-01 | | 4.70E-01 |
| | | 116.93 | | 8.32 | -9.29E-01 | | 1.34E+00 |
| | | 228.19 | | 10.56 | -4.29E-01 | | 8.74E-01 |
| | | 277.60 | | 14.00 | -4.97E-02 | | 7.01E-01 |
| | CM-245 | 99.52 | | 21.10 | -4.14E-02 | 3.22E-01 | 6.33E-01 |

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|
| | 103.73 | 33.60 | -1.00E-01 | | 3.22E-01 |
| | 116.93 | 12.20 | -6.34E-01 | | 9.11E-01 |
| | 174.94 | 9.50 | -1.21E-01 | | 9.79E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: Edward S. Wallace, Edward S. Wallace 4-02-08
(print/sign/date)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# Sample Check-in List

Date/Time Received: 4 3 08 1030 GM Screen Result 0.1K

Client: WCH SDG #: J00166 NA[ ] SAF #: RC-087 NA[ ]

Work Order Number: J8D030231 Chain of Custody # RC-087-059,-060

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? NA [ ] Yes [✓] No [ ]
4. Cooler Temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ____ Tape
   - ✓ Custody Seals
   - ____ Hazard Lables
   - ✓ Appropriate Sample Lables
9. Samples are:
   - ✓ In Good Condition
   - ____ Broken
   - ____ Leaking
   - ____ Have Air Bubbles
   - (Only for samples requiring no head space.)
10. Sample pH taken? NA [✓] SOIL pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount $HNO_3$ Added _____
11. Sample Location, Sample Collector Listed? *
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: _____ Date: 4 3 08

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person Contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

TESTAMERICA

4/20/2008 7:31:06 AM

# Sample Preparation/Analysis

Balance Id:1120373922

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

6A Pu PrpRC5013/RC5019, SepRC5010(5039)
SO Plutonium-238,239/40 by Alpha Spec
5I CLIENT: HANFORD

RC5086 & RC5087

Pipet #:

AnalyDueDate: 04/15/2008

Sep1 DT/Tm Tech:

Batch: 8101295 SOIL pCi/g PM, Quote: SS , 27038

Sep2 DT/Tm Tech:

PRIORITY

SEQ Batch, Test: None

Prep Tech: ,Barcotl

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|
| 1 KK1CE-1-AD<br>J8D090287-1-SAMP<br>03/28/2008 09:15 | AmtRec: 60G | 1.01g,in | PUTC11098<br>03/21/08,pd<br>06/07/94,r<br>#Containers: 1 | 200 | | Scr: | Alpha: | Beta: |
| 2 KK1CE-1-AJ-X<br>J8D090287-1-DUP<br>03/28/2008 09:15 | AmtRec: 60G | 1.02g,in | PUTC11099<br>03/21/08,pd<br>06/07/94,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |
| 3 KK3CR-1-AA-BX<br>J8D100000-295-MBLK<br>03/28/2008 09:15 | AmtRec: | 1.02g,in | PUTC11100<br>03/21/08,pd<br>06/07/94,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |
| 4 KK3CR-1-AC-CM<br>J8D100000-295-MLCS<br>03/28/2008 09:15 | AmtRec: | 1.00g,in | PUSK0723<br>04/18/08,pd<br>06/07/94,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |

Comments:

All Clients for Batch:
127642, Washington Closure Hanford Bechtel Hanford, Inc. , SS , 27038

KK1CE1AD-SAMP Constituent List:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PU-238 | RDL:1 | pCi/g | LCL: | UCL: | RPD: | PU-239 | RDL:1 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| Pu-242 | RDL: | pCi/g | LCL:20 | UCL:105 | RPD:35 | | | | | | |

KK3CR1AA-MBLK:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PU-238 | RDL:1 | pCi/g | LCL: | UCL: | RPD: | PU-239 | RDL:1 | pCi/g | LCL: | UCL: | RPD: |
| Pu-242 | RDL: | pCi/g | LCL:20 | UCL:105 | RPD:35 | | | | | | |

KK3CR1AC-MLCS:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PU-239 | RDL:1 | pCi/g | LCL:70 | UCL:130 | RPD:35 | Pu-242 | RDL: | pCi/g | LCL:20 | UCL:105 | RPD:35 |

4/20/2008 7:31:06 AM

# Sample Preparation/Analysis

6A Pu PrpRC5013/RC5019, SepRC5010(5039)
SO Plutonium-238,239/40 by Alpha Spec
5I CLIENT: HANFORD

Balance Id:1120373922

Pipet #:

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: ,Barcotl

AnalyDueDate: 04/15/2008

Batch: 8101295 pCi/g
SEQ Batch, Test: None

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|

KK1CE1AD-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
KK3CR1AA-MBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
KK3CR1AC-MLCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

4/24/2008 10:30:22 AM

# ICOC Fraction Transfer/Status Report

ByDate: 4/25/2007, 4/29/2008, Batch: '8101295', User: *ALL Order By DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | | | Comments |
|---|---|---|---|---|---|---|
| 8101295 | | | | | | |
| AC | Rev1C | WoodT | 4/20/2008 7:30:33 | | | |
| SC | | antonsonl | IsBatched | 4/10/2008 4:05:44 PM | | ICOC_RADCALC v4.8.32 |
| SC | | WoodT | InPrep | 4/20/2008 7:30:33 AM | | RICH-RC-5013 Revision 7 |
| SC | | WoodT | Prep1C | 4/20/2008 8:14:18 AM | | RICH-RC-5013 REVISION 7 |
| SC | | WoodT | InSep1 | 4/22/2008 8:31:38 AM | | RICHRC 5086 REV 3 |
| SC | | NortonJ | Sep1C | 4/22/2008 10:33:29 AM | | RICHRC 5086 REV3 |
| SC | | NortonJ | InSep2 | 4/22/2008 10:34:08 AM | | RICHRC 5087 REV1 |
| SC | | NortonJ | Sep2C | 4/23/2008 7:37:57 AM | | RICHRC 5087 REV1 |
| SC | | NortonJ | InEd | 4/23/2008 7:39:45 AM | | RICHRC 5039 REV 5 |
| SC | | BlackCL | InCnt1 | 4/23/2008 10:30:18 AM | | RICH-RD-0008 REVISION 4 |
| SC | | DAWKINSO | CalcC | 4/23/2008 6:21:17 PM | | RICH-RD-0008 REVISION 4 |
| SC | | nortonj | Rev1C | 4/24/2008 10:30:16 AM | | RICH-RC-0002 REV 8 |
| AC | | WoodT | 4/20/2008 8:14:18 | | | |
| AC | | WoodT | 4/22/2008 8:31:38 | | | |
| AC | | NortonJ | 4/22/2008 10:33:29 | | | |
| AC | | NortonJ | 4/22/2008 10:34:08 | | | |
| AC | | NortonJ | 4/23/2008 7:37:57 | | | |
| AC | | NortonJ | 4/23/2008 7:39:45 | | | |
| AC | | BlackCL | 4/23/2008 10:30:18 | | | |
| AC | | DAWKINSO | 4/23/2008 6:21:17 PM | | | |
| AC | | nortonj | 4/24/2008 10:30:16 | | | |

*AC: Accepting Entry; SC: Status Change*

*TAL Richland*

Richland Wa.



Grp Rec Cnt: 10

ICOCFractions v4.8.33

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# ***RE-ANALYSIS REQUEST***

DUE DATE 4-15

CUSTOMER WHC

ANALAYSIS AM150

MATRIX SOIL

LOT NUMBER J8D090287

SAMPLE DELIVERY GROUP

OLD BATCH NUMBER 810 1292

NEW BATCH NUMBER 811 5217

| LAB SAMPLE ID | CLIENT ID | REASON FOR REQUEST & ANALYSIS COMMENTS |
|---|---|---|
| 1) KKICE INC | 127642 | U150 INTERFERENCE |
| 2) KKICE INGX | | |
| 3) BX | | |
| 4) CM | | |
| 5) | | RUN ~~1.0g~~ 0.5g |
| 6) | | |
| 7) | | USE 2 UTEVAS IN 5072 |
| 8) | | |
| 9) | | |
| 10) | | |
| 11) | | |
| 12) | | |
| 13) | | |
| 14) | | |
| 15) | | |
| 16) | | |
| 17) | | |
| 18) | | |
| 19) | | |
| 20) | | |
| LAB QC ID | | Assigned with new batch. |

RC-048, 12/07, Rev 8

TESTAMERICA

4/25/2008 6:56:14 AM

# Sample Preparation/Analysis

Balance Id:

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

8E Am PrpRC5013/RC5019, SepRC5080(5003)
SX Americium-241 by Alpha Spec
5I CLIENT: HANFORD

PRIORITY

Pipet #:

Sep1 DT/Tm Tech:

AnalyDueDate: 04/15/2008

Batch: 8115217 SOIL pCi/g PM, Quote: SS , 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None All Tests: 8101290 AXTA, 8101292 8ESX, 8101293 7SSR, 8101295 6ASO, 8115217 8ESX,

Prep Tech: WoodT

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|
| 1 KK1CE-2-AC<br>J8D090287-1-SAMP<br>03/28/2008 09:15 | | 0.50g,in<br>AmtRec: 60G | AMTD0077<br>04/18/08,pd<br>06/01/01,r<br>#Containers: 1 | 200 | | Scr: | Alpha: | Beta: |
| 2 KK1CE-2-AG-X<br>J8D090287-1-DUP<br>03/28/2008 09:15 | | 0.50g,in<br>AmtRec: 60G | AMTD0078<br>04/24/08,pd<br>06/01/01,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |
| 3 KLW8A-1-AA-B<br>J8D240000-217-BLK<br>03/28/2008 09:15 | | 0.50g,in<br>AmtRec: | AMTD0079<br>04/24/08,pd<br>06/01/01,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |
| 4 KLW8A-1-AC-C<br>J8D240000-217-LCS<br>03/28/2008 09:15 | | 0.50g,in<br>AmtRec: | AMSJ0242<br>04/18/08,pd<br>06/01/01,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |

123 124 125 5212

**Comments:** - Samples run through double UTEVA cartridges to trap Uranium. Samples then run through TRU cartridge per procedure. 4/25/08 APA

All Clients for Batch:
127642, Washington Closure Hanford Bechtel Hanford, Inc. , SS , 27038

KK1CE2AC-SAMP Constituent List:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Am-241 | RDL:1 | pCi/g | LCL:70 | UCL:130 | RPD:35 | AM-243 | RDL: | pCi/g | LCL:20 | UCL:105 | RPD:35 |

KLW8A1AA-BLK:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Am-241 | RDL:1 | pCi/g | LCL: | UCL: | RPD: | AM-243 | RDL: | pCi/g | LCL:20 | UCL:105 | RPD:35 |

KLW8A1AC-LCS:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Am-241 | RDL:1 | pCi/g | LCL:70 | UCL:130 | RPD:35 | AM-243 | RDL: | pCi/g | LCL:20 | UCL:105 | RPD:35 |

TESTAMERICA

4/25/2008 6:56:25 AM

# Sample Preparation/Analysis

8E Am PrpRC5013/RC5019, SepRC5080(5003)
SX Americium-241 by Alpha Spec
5I CLIENT: HANFORD

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech: ,WoodT

PRIORITY

AnalyDueDate: 04/15/2008

Batch: 8115217 pCi/g
SEQ Batch, Test: None

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|

```
KK1CE2AC-SAMP Calc Info:
    Uncert Level (#s).: 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: B
KLW8A1AA-BLK:
    Uncert Level (#s).: 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: B
KLW8A1AC-LCS:
    Uncert Level (#s).: 2    Decay to SaDt: Y    Blk Subt.: N    Sci.Not.: Y    ODRs: B
```

Approved By _____ Date: _____

53

4/29/2008 8:26:56 AM

# ICOC Fraction Transfer/Status Report

ByDate: 4/30/2007, 5/4/2008, Batch: '8115217', User: *ALL Order By DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | | | Comments |
|---|---|---|---|---|---|---|
| 8115217 | | | | | | |
| AC | | Rev1C | WoodT | 4/24/2008 7:01:25 PM | | |
| SC | | | nortonj | IsBatched | 4/24/2008 9:29:32 AM | ICOC_RADCALC v4.8.32 |
| SC | | | WoodT | InPrep | 4/24/2008 7:01:25 PM | RICH-RC-5013 Revision 7 |
| SC | | | WoodT | Prep1C | 4/25/2008 6:55:47 AM | RICH-RC-5013 REVISION 7 |
| SC | | | AshworthA | Sep1C | 4/25/2008 1:00:35 PM | RICH-RC-5072 REV6 |
| SC | | | AshworthA | Sep2C | 4/28/2008 1:48:38 PM | RICH-RC-5003 REVISION 6 |
| SC | | | ClarkR | InCnt1 | 4/28/2008 1:52:18 PM | RICH-RD-0008 REVISION 4 |
| SC | | | DAWKINSO | CalcC | 4/28/2008 9:10:12 PM | RICH-RD-0008 REVISION 4 |
| SC | | | antonsonl | Rev1C | 4/29/2008 8:26:39 AM | RICH-RC-0002 REV 8 |
| AC | | | WoodT | 4/25/2008 6:55:47 | | |
| AC | | | AshworthA | 4/25/2008 1:00:35 PM | | |
| AC | | | AshworthA | 4/28/2008 1:48:38 PM | | |
| AC | | | ClarkR | 4/28/2008 1:52:18 PM | | |
| AC | | | DAWKINSO | 4/28/2008 9:10:12 PM | | |
| AC | | | antonsonl | 4/29/2008 8:26:39 | | |

*AC: Accepting Entry; SC: Status Change*

*TAL Richland*

Richland Wa.

Page 1

Grp Rec Cnt:7

ICOCFractions v4.8.33

WCH

TESTAMERICA

4/14/2008 11:19:37 AM

# Sample Preparation/Analysis

Balance Id:1120421763

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

PRIORITY

Pipet #: _____

AnalyDueDate: 04/15/2008

Sep1 DT/Tm Tech:

Batch: 8101290 SOIL pCi/g PM, Qu[redacted]:SS , 27[redacted]

Sep2 DT/Tm Tech:

SEQ Batch, Test: None All Tests: 8101290 AXTA, 8101292 8ESX, 8101293 7SSR, 8101295 [redacted]O.

Prep Tech: ,WoodT

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Dish Size | Ppt or Geometry | Count Time | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 KK1CE-1-AE<br>J8D090287-1-SAMP<br>03/28/2008 09:15 | | 42.10g,in<br>AmtRec: 60G #Containers: 1 | | | 25 | 1000 | 67 | 0330 | 4/14/08 | |
| 2 KK1CE-1-AF-X<br>J8D090287-1-DUP<br>03/28/2008 09:15 | | Not enough sample 4/14/08 JW<br>AmtRec: 60G #Containers: 1 | | | | | ~~GT6~~ 4/17/08<br>36 | 0050 | 4/16/08 | |
| 3 KK3CE-1-AA-B<br>J8D100000-290-BLK<br>03/28/2008 09:15 | | 25.00g,in<br>AmtRec: #Containers: 1 | | | 25 | | 68 | 0331 | 4/15/08 | |
| 4 KK3CE-1-AC-C<br>J8D100000-290-LCS<br>03/28/2008 09:15 | | 25.00g,in<br>AmtRec: #Containers: 1 | GSE1235<br>11/27/07,pd<br>06/08/05 r | | | | 66 | 0332 | 4/15/08 | |

Scr: Alpha: Beta:

**Comments:** Not enough sample for a chip. Please recount on a separate detector. JW 4/14/08

All Clients for Batch:
127642, Washington Closure Hanford Bechtel Hanford, Inc. , SS , 27038

KK1CE1AE-SAMP Constituent List:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Co-60 | RDL:5.00E-02 | pCi/g | LCL: | UCL: | RPD: | Cs-137 | RDL:1.00E-01 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| Cs-137DA | RDL:1.00E-01 | pCi/g | LCL:70 | UCL:130 | RPD:35 | Eu-152 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| Eu-154 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | Eu-155 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |

KK3CE1AA-BLK:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Co-60 | RDL:5.00E-02 | pCi/g | LCL: | UCL: | RPD: | Cs-137 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| Cs-137DA | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | Eu-152 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |



55

TESTAMERICA

4/14/2008 11:19:40 AM

# Sample Preparation/Analysis

Balance Id:na

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 04/15/2008

Sep1 DT/Tm Tech:

Batch: 8101290 pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WoodT

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Eu-154 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | Eu-155 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| KK3CE1AC-LCS: | | | | | | | | | | | |
| Cs-137 | RDL:0.1 | pCi/g | LCL:70 | UCL:130 | RPD:35 | Cs-137DA | RDL:0.1 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| K-40 | RDL:-- | pCi/g | LCL:70 | UCL:130 | RPD:35 | Ra-226 | RDL:0.1 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| RA-228 | RDL:0.2 | pCi/g | LCL:70 | UCL:130 | RPD:35 | RA-228DA | RDL:0.2 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| U-238 | RDL: | pCi/g | LCL:70 | UCL:130 | RPD:35 | | | | | | |

KK1CE1AE-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

KK3CE1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

KK3CE1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

4/17/2008 1:51:02 PM

# ICOC Fraction Transfer/Status Report

ByDate: 4/18/2007, 4/22/2008, Batch: '8101290', User: *ALL Order By DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | | | Comments |
|---|---|---|---|---|---|---|
| 8101290 | | | | | | |
| AC | | Rev1C | WoodT | 4/14/2008 10:52:16 | | |
| SC | | | antonsonl | IsBatched | 4/10/2008 4:05:44 PM | ICOC_RADCALC v4.8.32 |
| SC | | | WoodT | InPrep | 4/14/2008 10:52:16 AM | RICH-RC-5013 Revision 7 |
| SC | | | WoodT | Prep1C | 4/14/2008 11:19:58 AM | RICH-RC-5013 REVISION 7 |
| SC | | | WoodT | InPrep2 | 4/14/2008 11:20:09 AM | RICH-RC-5017 REVISION 6 |
| SC | | | WoodT | Prep2C | 4/14/2008 11:20:22 AM | RICH-RC-5017 REVISION 6 |
| SC | | | BlackCL | InCnt1 | 4/14/2008 11:57:25 AM | RICH-RD-0007 REVISION 6 |
| SC | | | BlackCL | CalcC | 4/17/2008 6:10:18 AM | RICH-RD-0007 REVISION 6 |
| SC | | | antonsonl | Rev1C | 4/17/2008 1:50:53 PM | RICH-RC-0002 REV 8 |
| AC | | | WoodT | 4/14/2008 11:19:58 | | |
| AC | | | WoodT | 4/14/2008 11:20:09 | | |
| AC | | | WoodT | 4/14/2008 11:20:22 | | |
| AC | | | BlackCL | 4/14/2008 11:57:25 | | |
| AC | | | BlackCL | 4/17/2008 6:10:18 | | |
| AC | | | antonsonl | 4/17/2008 1:50:53 PM | | |

*AC: Accepting Entry; SC: Status Change*

*TAL Richland*

Richland Wa.

Page 1

Grp Rec Cnt: 7

ICOCFractions v4.8.33

TESTAMERICA

5/12/2008 11:49:40 AM

# Sample Preparation/Analysis

Balance Id:11

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

7Z Unat Laser PrpRC5013/RC5019, SepRC5015
SS Total Uranium by KPA
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 04/15/2008

Sep1 DT/Tm Tech:

Batch: 8128241 SOIL ug/g PM, Quote: SS , 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: WoodT

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|
| 1 KK1CE-1-AK<br>J8D090287-1-SAMP<br>03/28/2008 09:15 | 1.03g | 1.03g,in<br>AmtRec: 60G | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 2 KK1CE-1-AL-S<br>J8D090287-1-MS<br>03/28/2008 09:15 | 1.03g | 1.04g,in<br>AmtRec: 60G | UNSI1014<br>05/12/08,pd<br>08/01/57,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |
| 3 KK1CE-1-AM-X<br>J8D090287-1-DUP<br>03/28/2008 09:15 | 1.03g | 1.03g,in<br>AmtRec: 60G | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 4 KMN3F-1-AA-B<br>J8E070000-241-BLK<br>03/28/2008 09:15 | | 1.00g,in<br>AmtRec: | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 5 KMN3F-1-AC-C<br>J8E070000-241-LCS<br>03/28/2008 09:15 | | 1.00g,in<br>AmtRec: | UNSI1015<br>05/12/08,pd<br>08/01/57,r<br>#Containers: 1 | | | Scr: | Alpha: | Beta: |

**Comments:**

All Clients for Batch:
127642, Washington Closure Hanford Bechtel Hanford, Inc. , SS , 27038

KK1CE1AK-SAMP Constituent List:
Uranium RDL:1 ug/g LCL:70 UCL:130 RPD:35



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5/12/2008 11:49:43 AM

# Sample Preparation/Analysis

7Z Unat_Laser PrpRC5013/RC5019, SepRC5015
SS Total Uranium by KPA
5I CLIENT: HANFORD

Balance Id:11
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech: ,WoodT

AnalyDueDate: 04/15/2008

Batch: 8128241 ug/g
SEQ Batch, Test: None

| Work Order, Lot, Sample DateTime | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | Count Time Min | Detector Id | Count On \| Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|---|---|---|---|---|---|---|---|

KK1CE1AL-MS Constituent List:

KMN3F1AA-BLK:
Uranium RDL:1 ug/g LCL: UCL: RPD:
KMN3F1AC-LCS:
Uranium RDL:1 ug/g LCL:70 UCL:130 RPD:35

KK1CE1AK-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
KK1CE1AL-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
KMN3F1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
KMN3F1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

5/13/2008 2:39:10 PM

# ICOC Fraction Transfer/Status Report

ByDate: 5/14/2007, 5/18/2008, Batch: '8128241', User: *ALL Order By DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | | | Comments |
|---|---|---|---|---|---|---|
| 8128241 | | | | | | |
| *AC* | | Rev1C | NelsonT | 5/12/2008 12:28:45 | | |
| *SC* | | | wagarr | IsBatched | 5/7/2008 10:31:49 AM | ICOC_RADCALC v4.8.32 |
| *SC* | | | NelsonT | Cnt1C | 5/12/2008 12:28:45 PM | RICH-RC-5058 REV 7 |
| *SC* | | | nortonj | Rev1C | 5/13/2008 2:38:50 PM | RICH-RC-0002 REV 8 |
| *AC* | | | nortonj | 5/13/2008 2:38:50 PM | | |

*AC: Accepting Entry; SC: Status Change*

*TAL Richland*

Richland Wa.

Page 1

Grp Rec Cnt: 2

ICOCFractions v4.8.33

Analytical Data Package Prepared For

# Washington Closure Hanford

Analysis Provided By

*TestAmerica Richland*
2800 George Washington Way
Richland WA, 99354
(509)375-3131
Assigned Laboratory Code: TALR

RECEIVED
APR 2008

SDG Number: J00166

Data Package Contains 109 Pages

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

**Certificate of Analysis**

Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

April 23, 2008

Attention: Joan Kessner

| | | |
|---|---|---|
| SAF Number | : | RC-087 |
| Date SDG Closed | : | April 9, 2008 |
| Number of Samples | : | Twenty (20) |
| Sample Type | : | Soil |
| SDG Number | : | J00166 |
| Data Deliverable | : | Quick Turn Metals / Summary |

## CASE NARRATIVE

### I. Introduction

Between April 3, 2008 and April 9, 2006 twenty soil samples were received at TestAmerica for ICP metals analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID;

| WCH ID# | STLR ID# | MATRIX | DATE OF RECEIPT |
|---|---|---|---|
| J16DX8 | KKNG6 | SOIL | 04/03/08 |
| J16DX9 | KKNG7 | SOIL | 04/03/08 |
| J16DY0 | KKNG8 | SOIL | 04/03/08 |
| J16DY1 | KKNHE | SOIL | 04/03/08 |
| J16J24 | KKT7H | SOIL | 04/07/08 |
| J16J25 | KKT7K | SOIL | 04/07/08 |
| J16J53 | KKT7M | SOIL | 04/07/08 |
| J16J54 | KKT7Q | SOIL | 04/07/08 |
| J16J55 | KKT7R | SOIL | 04/07/08 |
| J16J56 | KKT7T | SOIL | 04/07/08 |
| J16J57 | KKT7V | SOIL | 04/07/08 |
| J16J58 | KKT7W | SOIL | 04/07/08 |
| J16J59 | KKT71 | SOIL | 04/07/08 |
| J16J60 | KKT73 | SOIL | 04/07/08 |
| J16J61 | KKT75 | SOIL | 04/07/08 |
| J16J62 | KKWA9 | SOIL | 04/08/08 |
| J16J65 | KKW83 | SOIL | 04/09/08 |
| J16J66 | KKW88 | SOIL | 04/09/08 |
| J16J63 | J16J43 | SOIL | 04/09/08 |
| J160C2 | J16J43 | SOIL | 04/09/08 |

## II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

## III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors. The requested analyses were:

**ICP Metals**
ICP Metals by method SW-846 601

## IV. Quality Control

SDG J00166 includes a minimum of one Laboratory Control Samples (LCS) and one method (reagent) blank. A duplicate sample, matrix spike sample and a matrix spike duplicate sample will be analyzed per 20 samples or per month, whichever is more frequent. Any exceptions have been noted in the "Comments" section.

Blanks and LCS are reported in mg/L units, other QC and sample results are reported in the same units.

## V. Comments

**ICP Metals**
ICP Metals by method SW-846 6010A
Five batches were analyzed in April 2008 for samples with the standard metal request list with add ons aluminum, beryllium, copper, iron, zinc and zirconium.

Batch 8094390:
Iron in both the ICV and CCV recovered high. Suspect cause of iron contamination is high levels of iron in the samples. Except as noted, the LCS, batch blank, sample, sample duplicate, MS, MSD, ICB and CCB results are within contractual limits.

Batch 8098413:
Iron in both the ICV and CCV recovered high. Suspect cause of iron contamination is high levels of iron in the samples. Except as noted, the LCS, batch blank, sample, sample duplicate, MS, MSD, ICB and CCB results are within contractual limits.

Batch 8099224:
Iron in both the ICV and CCV recovered high. Suspect cause of iron contamination is high levels of iron in the samples. Except as noted, the LCS, batch blank, sample, sample duplicate, MS, MSD, ICB and CCB results are within contractual limits.

Batch 8099501:
Iron in both the ICV and CCV recovered high. Suspect cause of iron contamination is high levels of iron in the samples. Except as noted, the LCS, batch blank, sample, sample duplicate, MS, MSD, ICB and CCB results are within contractual limits.

Batch 8100381:
Iron in both the ICV and CCV recovered high. Suspect cause of iron contamination is high levels of iron in the samples. Except as noted, the LCS, batch blank, sample, sample duplicate, MS, MSD, ICB and CCB results are within contractual limits.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Seger
Project Manager

TESTAMERICA

SDG Number: J00166
SAF Number: RC-087
Batch Number: 8094390

| Sample Number | Client ID | Aliquant | Aluminum | Arsenic | Barium | Berylium | Cadmium | Copper | Chromium | Iron | Lead | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa |
| KKN7G1AA-B | | 1.000 | -0.001 | -0.001 | 0.000 | 0.000 | 0 | -0.001 | -0.002 | 0.007 | 0.004 | 0.004 | 0.000 | 0.006 |
| KKN7G1AJ-C | | 1.000 | 0.968 | 0.992 | 0.974 | 1.045 | 0.9679 | 0.991 | 0.947 | 1.099 | 0.9654 | 0.939 | 0.948 | 0.993 |
| LCS Recovery % | | | 96.840% | 99.150% | 97.420% | 104.500% | 96.790% | 99.100% | 94.690% | 109.900% | 96.540% | 93.877% | 94.810% | 99.270% |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | g | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | | | | | | | | | |
| KKNG61AA | J16DX8 | 0.05165 | 82.914 | <MDL | <MDL | <MDL | <MDL | 43.998 | 357.406 | 2075.508 | 226.4279 | <MDL | 55.866 | <MDL |
| KKNG61AR-DUP | J16DX8-DUP | 0.5031 | 553.767 | <MDL | 5.476 | <MDL | <MDL | 39.257 | 343.272 | 3600.676 | 195.7861 | <MDL | 43.232 | 1.968 |
| | | | | | | | | | | | | | | |
| KKNG71AA | J16DX9 | 0.5123 | 5990.630 | 1.240 | 49.766 | 0.166 | 1.776303 | 11.234 | 11.077 | 15850.088 | 107.0662 | <MDL | <MDL | 51.298 |
| KKNG81AA | J16DY0 | 0.4934 | 9244.021 | <MDL | 72.163 | 0.122 | 5.472233 | 71.311 | 118.970 | 31566.680 | 86.57276 | <MDL | <MDL | 233.583 |
| KKNHE1AA | J16DY1 | 0.5122 | 5657.946 | 1.835 | 64.818 | 0.166 | 2.069504 | 21.544 | 18.245 | 16321.749 | 8.112066 | <MDL | <MDL | 61.470 |
| | | | | | | | | | | | | | | |
| KKNG61AJ-MS | J16DX8-MS | 0.5001 | N/A | 92.931 | 86.663 | 100.312 | 67.27654 | 130.574 | 462.507 | N/A | 292.4415 | 83.808 | 75.095 | 83.313 |
| % Recovery | | | | 92.931 | 86.663 | 100.312 | 67.277 | 86.576 | 105.102 | | 66.014 | 83.808 | 19.229 | 83.313 |
| KKNG61AK-MSD | J16DX8-MSD | 0.5135 | N/A | 91.373 | 87.907 | 99.528 | 66.23174 | 127.848 | 506.134 | N/A | 294.3525 | 80.994 | 64.206 | 84.869 |
| % Recovery | | | | 91.373 | 87.907 | 99.528 | 66.232 | 83.850 | 148.729 | | 67.925 | 80.994 | 8.340 | 84.869 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

TESTAMERICA

SDG Number: J00166
SAF Number: RC-087
Batch Number: 8098413

| Sample Number | Client ID | Aliquant | Aluminum | Arsenic | Barium | Berylium | Cadmium | Copper | Chromium | Iron | Lead | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa |
| KKVCG1AA-B | | 1.000 | 0.011 | 0.000 | 0.001 | 0.000 | 0.0002 | 0.000 | 0.001 | 0.071 | 0.0046 | 0.005 | 0.000 | 0.012 |
| KKVCG1AJ-LCS | | 1.000 | 0.957 | 0.996 | 0.962 | 1.069 | 0.9683 | 0.977 | 0.934 | 1.108 | 0.9596 | 0.935 | 0.948 | 0.983 |
| LCS Recovery % | | | 95.650% | 99.590% | 96.190% | 106.900% | 96.830% | 97.730% | 93.440% | 110.800% | 95.960% | 93.472% | 94.820% | 98.310% |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | g | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | | | | | | | | | |
| KKT7H1AA | J16J24 | 0.5034 | 5944.577 | 0.814 | 70.342 | 0.208582 | 2.274533 | 11.6905 | 8.581645 | 19288.836 | 4.578864 | <MDL | <MDL | 44.72586 |
| KKT7H1A1-DUP | J16J24-DUP | 0.4943 | 5188.145 | <MDL | 76.37063 | 0.192191 | 1.911794 | 10.04451 | 8.436172 | 16113.696 | 3.783128 | <MDL | <MDL | 33.73457 |
| | | | | | | | | | | | | | | |
| KKT7K1AA | J16J25 | 0.4949 | 5872.904 | 2.839 | 78.905 | 0.212 | 2.263083 | 11.639 | 8.608 | 18720.954 | 5.82946 | <MDL | <MDL | 42.322 |
| KKT7M1AA | J16J53 | 0.4946 | 5595.431 | <MDL | 67.206 | 0.192 | 2.527295 | 11.373 | 7.683 | 20976.547 | 5.367974 | <MDL | <MDL | 41.053 |
| KKT7Q1AA | J16J54 | 0.5124 | 8617.291 | 0.849 | 70.550 | 0.195 | 2.48829 | 11.495 | 10.597 | 20355.191 | 35.87041 | <MDL | <MDL | 48.614 |
| KKT7R1AA | J16J55 | 0.5127 | 6685.196 | 0.312 | 295.592 | <MDL | 2.447825 | 14.492 | 9.840 | 19923.932 | 22.17671 | <MDL | <MDL | 46.733 |
| KKT7T1AA | J16J56 | 0.4952 | 6533.724 | 0.828 | 154.685 | 0.202 | 2.736268 | 18.669 | 13.479 | 21153.069 | 39.18619 | <MDL | <MDL | 93.710 |
| KKT7V1AA | J16J57 | 0.4969 | 8192.795 | 0.553 | 70.869 | <MDL | 3.069028 | 49.366 | 23.194 | 19722.278 | 32.16945 | <MDL | <MDL | 795.935 |
| KKT7W1AA | J16J58 | 0.5113 | 5920.203 | 0.958 | 98.866 | 0.196 | 2.288285 | 18.795 | 10.913 | 18511.637 | 6.190104 | <MDL | <MDL | 60.278 |
| KKT711AA | J16J59 | 0.5018 | 5666.600 | 0.508 | 68.683 | 0.209 | 2.510961 | 12.874 | 7.652 | 20077.720 | 11.11997 | <MDL | <MDL | 49.472 |
| KKT731AA | J16J60 | 0.5108 | 5730.227 | 2.418 | 67.668 | 0.206 | 2.437353 | 12.412 | 7.381 | 19508.614 | 12.01057 | <MDL | <MDL | 57.753 |
| KKT751AA | J16J61 | 0.4958 | 5759.379 | 0.837 | 64.996 | 0.212 | 2.490924 | 19.877 | 7.483 | 20149.254 | 5.486083 | <MDL | <MDL | 49.697 |
| | | | | | | | | | | | | | | |
| KKT7H1AJ-MS | J16J24-MS | 0.5152 | N/A | 97.632 | 173.4278 | 103.8432 | 93.53649 | 156.347 | 96.23447 | N/A | 95.64247 | 88.23564 | 89.61568 | 134.1227 |
| % Recovery | | | | 96.818 | 103.086 | 103.635 | 91.262 | 144.657 | 87.653 | | 91.064 | 88.236 | 89.616 | 89.397 |
| KKT7H1AK-MSD | J16J24-MSD | 0.5084 | N/A | 97.895 | 207.7105 | 104.8387 | 94.48269 | 107.7891 | 96.18411 | N/A | 96.42014 | 88.75295 | 90.62746 | 132.9662 |
| % Recovery | | | | 97.081 | 137.369 | 104.630 | 92.208 | 96.099 | 87.602 | | 91.841 | 88.753 | 90.627 | 88.240 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

TESTAMERICA

SDG Number: J00166
SAF Number: RC-087
Batch Number: 8099224

| Sample Number | Client ID | Aliquant | Aluminum | Arsenic | Barium | Berylium | Cadmium | Copper | Chromium | Iron | Lead | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa |
| KKWDV1AA-BLK | | 1.000 | -0.0043 | 0.0008 | 0.0002 | 0 | 0 | 0.0007 | 0 | 0.0217 | 0.0014 | 0.00303 | 0.0004 | 0.0026 |
| KKWDV1AJ-LCS | | 1.000 | 0.9579 | 1.006 | 0.9805 | 1.078 | 0.9792 | 0.9912 | 0.9472 | 1.126 | 0.9794 | 0.94518 | 0.9556 | 0.991 |
| LCS Recovery % | | | 95.790% | 100.600% | 98.050% | 107.800% | 97.920% | 99.120% | 94.720% | 112.600% | 97.940% | 94.518% | 95.560% | 99.100% |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | g | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | | | | | | | | | |
| KKWA91AA | J16J62 | 0.4955 | 8365.28759 | <MDL | 67.30575 | 0.161453 | 2.310797 | 11.89707 | 7.547931 | 22058.527 | 786.2765 | <MDL | <MDL | 45.76186 |
| KKWA91AR-DUP | J16J62-DUP | 0.5323 | 11666.3536 | <MDL | 63.55439 | 0.159684 | 2.310727 | 12.38963 | 9.477738 | 20993.8 | 1042.645 | <MDL | <MDL | 53.11854 |
| | | | | | | | | | | | | | | |
| KKWA91AJ-MS | J16J62-MS | 0.5429 | N/A | 90.33892 | 144.9622 | 96.70289 | 87.47467 | 102.3209 | 93.01897 | N/A | N/A | 82.08049 | 84.01179 | 129.7661 |
| % Recovery | | | | 90.339 | 77.656 | 96.541 | 85.164 | 90.424 | 85.471 | | | 83.808 | 84.012 | 83.313 |
| KKWA91A1-MSD | J16J62-MSD | 0.4855 | N/A | 101.8023 | 156.1277 | 109.3718 | 99.17611 | 112.3584 | 100.309 | N/A | N/A | 94.41298 | 94.71679 | 140.0618 |
| % Recovery | | | | 101.802 | 88.822 | 109.210 | 96.865 | 100.461 | 92.761 | | | 94.413 | 94.717 | 140.062 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

SDG Number: J00166
SAF Number: RC-087
Batch Number: 8099501

| Sample Number | Client ID | Aliquant | Aluminum | Arsenic | Barium | Berylium | Cadmium | Copper | Chromium | Iron | Lead | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa |
| KKXJG1AA-BLK | | 1.000 | -0.010 | -0.001 | 0.000 | 0.000 | 0.0001 | 0.002 | 0.000 | 0.010 | 0.002 | 0.002 | 0.000 | 0.012 |
| KKXJG1AJ-LCS | | 1.000 | 0.979 | 1.024 | 1.007 | 1.104 | 0.9991 | 1.019 | 0.972 | 1.144 | 0.9939 | 0.957 | 0.978 | 1.010 |
| LCS Recovery % | | | 97.880% | 102.400% | 100.700% | 110.400% | 99.910% | 101.900% | 97.150% | 114.400% | 99.390% | 95.710% | 97.750% | 101.000% |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | g | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | | | | | | | | | |
| KKW831AA | J16J65 | 0.5001 | 5765.84683 | 0.79984 | 63.74725 | 0.19996 | 2.309538 | 17.45651 | 8.788242 | 20305.939 | 9.44811 | <MDL | <MDL | 50.44991 |
| KKW831A1-DUP | J16J65-DUP | 0.5128 | 4966.84867 | <MDL | 50.74103 | 0.185257 | 1.638066 | 13.97231 | 6.922777 | 16887.676 | 377.5351 | <MDL | <MDL | 39.64509 |
| KKW881AA | J16J66 | 0.498 | 5767.06827 | <MDL | 67.67068 | 0.210843 | 1.977912 | 14.93976 | 7.670683 | 20341.365 | 7.439759 | <MDL | <MDL | 42.07831 |
| | | | | | | | | | | | | | | |
| KKW831AJ-MS | J16J65-MS | 0.4907 | N/A | 103.4237 | 166.2931 | 110.1488 | 99.44977 | 117.4852 | 101.8341 | N/A | 182.8001 | 93.57245 | 95.41471 | 152.4353 |
| % Recovery | | | | 102.624 | 102.546 | 109.949 | 97.140 | 100.029 | 93.046 | | 173.352 | 93.572 | 95.415 | 101.985 |
| KKW831AR-MSD | J16J65-MSD | 0.513 | N/A | 96.47173 | 161.0136 | 102.6316 | 93.0117 | 110.4288 | 94.25926 | N/A | 99.12281 | 87.70858 | 89.20078 | 142.3002 |
| % Recovery | | | | 95.672 | 97.266 | 102.432 | 90.702 | 92.972 | 85.471 | | 89.675 | 87.709 | 89.201 | 91.850 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

TESTAMERICA

SDG Number: J00166
SAF Number: RC-087
Batch Number: 8100381

| Sample Number | Client ID | Aliquant | Aluminum | Arsenic | Barium | Berylium | Cadmium | Copper | Chromium | Iron | Lead | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa | mg/sa |
| KK1E11AA-BLK | | 1.000 | -0.0036 | -0.001 | 0.0003 | 0 | 0.0002 | 0.0016 | 0 | 0.0122 | 0.0022 | 0.0046 | 0.0008 | 0.0032 |
| KK1E11AJ-LCS | | 1.000 | 0.9745 | 1.028 | 0.9885 | 1.106 | 1.005 | 1.004 | 0.965 | 1.136 | 0.999 | 0.96855 | 0.9619 | 1.024 |
| LCS Recovery % | | | 97.450% | 102.800% | 98.850% | 110.600% | 100.500% | 100.400% | 96.500% | 113.600% | 99.900% | 96.855% | 96.190% | 102.400% |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | g | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | | | | | | | | | |
| KK0CW1AA | J16J63 | 0.5172 | 5739.55916 | 1.102088 | 77.1075 | 0.203016 | 2.213844 | 1659.899 | 6.892885 | 20504.64 | 126.0634 | <MDL | <MDL | 117.0727 |
| KK0CW1A1-DUP | J16J63-DUP | 0.492 | 6179.87805 | <MDL | 63.41463 | 0.203252 | 2.743902 | 13.68902 | 9.461382 | 25477.642 | 4.847561 | <MDL | <MDL | 55.64024 |
| KK0C21AA | J16J64 | 0.4964 | 5976.0274 | <MDL | 78.27357 | 0.20145 | 2.628928 | 15.16922 | 9.206285 | 23892.023 | 7.453666 | <MDL | <MDL | 49.34529 |
| | | | | | | | | | | | | | | |
| KK0CW1AJ-MS | J16J63-MS | 0.4966 | N/A | 101.9936 | 165.3242 | 108.236 | 98.31857 | 120.7209 | 98.91261 | N/A | 99.88925 | 93.40314 | 92.11639 | 149.8188 |
| % Recovery | | | | 100.891 | 88.217 | 108.033 | 96.105 | -1539.179 | 92.020 | | -26.174 | 93.403 | 92.116 | 32.746 |
| KK0CW1AR-MSD | J16J63-MSD | 0.5052 | N/A | 99.86144 | 158.4521 | 106.6904 | 96.70428 | 111.342 | 98.07997 | N/A | 98.50554 | 92.07641 | 90.192 | 145.9818 |
| % Recovery | | | | 98.759 | 81.345 | 106.487 | 94.490 | -1548.557 | 91.187 | | -27.558 | 92.076 | 90.192 | 28.909 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

TESTAMERICA

10

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-059 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** B Lawrence, E. Harries | **Company Contact** Joan Kessner | **Telephone No.** 509-375-4688 | **Project Coordinator** KESSNER, JH |
| **Price Code** | **Data Turnaround** 24 Hours | | |
| **Project Designation** 618-7 Burial Ground - Soil | **Sampling Location** 618-7 Burial Ground/Stockpiles | | **SAF No.** RC-087 |
| **Ice Chest No.** ERC-99-051 | **Field Logbook No.** EL-1395-12 | **COA** RG61872600 | **Method of Shipment** Government Vehicle |
| **Shipped To** TestAmerica Incorporated, Richland | **Offsite Property No.** N/A | | **Bill of Lading/Air Bill No.** N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | None | | | | | | | | | | |
| **Type of Container** | aG | | | | | | | | | | |
| **No. of Container(s)** | 1 | | | | | | | | | | |
| **Volume** | 60mL | | | | | | | | | | |
| **SAMPLE ANALYSIS** | See item (1) in Special Instructions. | | | | | | | | TIE TO RCF | | |
| **Sample No.** | **Matrix *** | **Sample Date** | **Sample Time** | | | | | | | | |
| J16DX8 KKNG6 | SOIL | 3-28-08 | 0915 | X | | | | | | J16DW8 | | AN-01 |
| J16DX9 KKNG7 | SOIL | 3-28-08 | 0925 | X | | | | | | J16DW9 | | AN-02 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: B Lawrence | 3-28-08 1100 | Received By/Stored In: RB Kerkow / RB Kerk | 3-28-08 1100 |
| Relinquished By/Removed From: RB Kerkow / RB Kerk | 3-28-08 1230 | Received By/Stored In: REF / B (RBK) | 3-28-08 1230 |
| Relinquished By/Removed From: 1060 BATELLE 1B | 4/3/08 0900 | Received By/Stored In: DAVID ST. JOHN | 4/3/08 0900 |
| Relinquished By/Removed From: DAVID ST. JOHN | 4/3/08 1030 | Received By/Stored In: LJ LANE TALR 4308 | 1030 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP - 6010 - Quick Turn (Add On) (Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium)

J8D030231
J00166
DUE 4-4-08

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
Ve=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

TESTAMERICA

11

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-060 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B Lawrence, E. Harries | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Price Code | Data Turnaround<br>**24 Hours** | | |
| Project Designation<br>618-7 Burial Ground - Soil | Sampling Location<br>618-7 Burial Ground/Stockpiles | | SAF No.<br>RC-087 |
| Ice Chest No.<br>ERC-99-051 | Field Logbook No.<br>EL-1395-12 | COA<br>RG61872600 | Method of Shipment<br>Government Vehicle |
| Shipped To<br>TestAmerica Incorporated, Richland | Offsite Property No.<br>N/A | | Bill of Lading/Air Bill No.<br>N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | HE TO RCF | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J16DY0 KKNG8 | SOIL | 3-28-08 | 1005 | X | | | | | | J16DX0 | | E006 | 10 |
| J16DY1 KKNHE | SOIL | 3-28-08 | 1010 | X | | | | | | J16DX1 | | E007 | 11 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From<br>B LAWRENCE | Date/Time 1100 3-28-08 | Received By/Stored In<br>RB KERKOW / RB Kurk | Date/Time 1100 3-28-08 |
| Relinquished By/Removed From<br>RB KERKOW / RB Kurk | Date/Time 1230 3-28-08 | Received By/Stored In<br>REF 1B (CROC) | Date/Time 3-28-08 1230 |
| Relinquished By/Removed From<br>1060 BATELLE 1B | Date/Time 4/3/08 0900 | Received By/Stored In<br>DAVID STUDYAN | Date/Time 4/3/08 0900 |
| Relinquished By/Removed From<br>DAVID STUDYAN | Date/Time 4/3/08 1030 | Received By/Stored In<br>RH WLANETALK | Date/Time 1030 4308 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP - 6010 - Quick Turn (Add On) (Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium)

J8D030231
J00166
DUE 4 4 08

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
Ve=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

**Radiological Counting Facility**

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19364 |
| Sample Description | : J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 4.800E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 9:15:00AM |
| Acquisition Started | : 3/31/2008 11:31:15AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3716.2 seconds |
| Dead Time | : 3.13 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/4/2008 |
| Efficiency Calibration Description | : 50ml Pill Box (1234-95-2) 2/4/2008 |

Sample Number : 18288

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.991 | 1.97E+02 | 1.83E+01 | |
| U-235 | | 0.981 | 2.70E+03 | 8.44E+01 | |
| U-238d | @ | 0.986 | 2.43E+04 | 1.42E+03 | |

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium

Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 12:33:14PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 1 | 52.88 | NP | 3.28E+00 | 5.93 |
| | 3 | 83.70 | NP | 2.08E+01 | 1.37 |
| m | 5 | 94.21 | Th-234 | 1.32E+02 | 0.18 |
| m | 6 | 97.98 | NP | 1.47E+02 | 0.14 |
| M | 7 | 110.60 | ~~Th-234~~ Pa-234 | 5.12E+01 | 0.48 |
| m | 8 | 112.36 | Th-234 | 3.43E+01 | 0.71 |
| m | 9 | 114.25 | NP | 2.86E+01 | 0.68 |
| | 10 | 120.37 | NP | 2.63E-01 | 60.48 |
| | 11 | 130.96 | NP | 1.65E+00 | 15.95 |
| | 15 | 194.56 | NP | 1.41E+00 | 9.24 |
| M | 16 | 201.62 | NP | 1.90E+00 | 2.89 |
| M | 18 | 221.07 | NP | 2.30E-01 | 18.19 |
| m | 19 | 226.59 | NP | 7.55E-01 | 6.82 |
| | 20 | 257.77 | NP | 4.37E+00 | 2.25 |
| | 21 | 387.32 | NP | 2.18E-01 | 29.11 |
| | 22 | 568.87 | NP | 6.39E-01 | 9.33 |
| | 23 | 690.59 | NP | 2.92E-01 | 17.57 |
| M | 24 | 701.36 | NP | 2.19E-01 | 9.52 |
| m | 25 | 705.58 | NP | 2.56E-01 | 8.75 |
| | 26 | 733.17 | NP | 2.95E-01 | 16.36 |
| | 27 | 742.56 | NP | 2.91E+00 | 2.09 |
| | 28 | 766.13 | NP | 1.01E+01 | 0.77 |
| | 29 | 786.07 | Bi-214 | 1.36E+00 | 4.17 |
| | 30 | 805.60 | Bi-214 | 3.41E-01 | 12.95 |
| M | 31 | 824.65 | NP | 1.57E-01 | 9.99 |
| m | 32 | 831.37 | NP | 1.47E-01 | 10.48 |
| | 33 | 851.13 | NP | 1.59E-01 | 22.05 |
| M | 34 | 880.40 | NP | 4.22E-01 | 4.37 |
| m | 35 | 883.04 | NP | 5.57E-01 | 3.29 |
| m | 36 | 886.97 | NP | 1.90E-01 | 7.14 |
| M | 37 | 921.48 | NP | 2.70E-01 | 6.11 |
| m | 38 | 925.97 | NP | 8.05E-01 | 2.44 |
| | 39 | 945.67 | NP | 9.09E-01 | 3.44 |
| | 40 | 1000.70 | Pa-234M | 2.28E+01 | 0.39 |
| | 41 | 1043.73 | NP | 7.98E-02 | 23.52 |
| | 42 | 1124.69 | NP | 1.20E-01 | 14.97 |
| | 43 | 1193.34 | NP | 3.16E-01 | 5.98 |
| | 44 | 1236.93 | NP | 1.42E-01 | 11.64 |
| | 45 | 1393.41 | NP | 7.93E-02 | 15.58 |
| | 46 | 1413.72 | NP | 2.55E-02 | 38.32 |
| | 47 | 1433.82 | NP | 1.95E-01 | 6.78 |

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 49 | 1510.08 | NP | 2.47E-01 | 5.56 |
| | 50 | 1527.09 | NP | 4.35E-02 | 23.97 |
| | 51 | 1553.76 | NP | 1.07E-01 | 11.30 |
| | 52 | 1737.74 | NP | 3.84E-01 | 3.19 |
| | 53 | 1765.62 | NP | 1.10E-01 | 8.25 |
| M | 54 | 1809.38 | NP | 5.77E-02 | 6.88 |
| m | 55 | 1820.25 | NP | 1.25E-02 | 18.57 |
| | 56 | 1831.45 | NP | 2.84E-01 | 3.79 |
| M | 57 | 1867.95 | NP | 1.61E-01 | 3.92 |
| m | 58 | 1875.50 | NP | 1.45E-01 | 4.11 |
| | 59 | 1893.95 | NP | 4.22E-02 | 11.36 |
| | 60 | 1911.41 | NP | 9.37E-02 | 6.55 |
| | 61 | 1937.33 | NP | 5.78E-02 | 7.91 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

# NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.97E+02 | 2.11E+01 | 2.11E+01 |
| | CO-60 | 1173.24 | | 99.90 | 1.75E-01 | 2.10E+00 | 2.48E+00 |
| | | 1332.50 | | 99.98 | 6.03E-01 | | 2.10E+00 |
| | NB-94 | 702.63 | | 99.81 | -4.07E-01 | 4.00E+00 | 4.82E+00 |
| | | 871.10 | | 99.89 | -6.27E+00 | | 4.00E+00 |
| | AG-108m | 433.94 | | 90.50 | 3.23E+00 | 4.32E+00 | 4.32E+00 |
| | | 614.28 | | 89.80 | 2.55E+00 | | 4.64E+00 |
| | | 722.94 | | 90.80 | -2.11E+00 | | 4.96E+00 |
| | CS-137 | 661.66 | | 85.21 | -3.37E+00 | 4.94E+00 | 4.94E+00 |
| | EU-152 | 40.12 | | 38.40 | -9.17E+00 | 9.83E+00 | 1.03E+01 |
| | | 45.38 | | 11.10 | -6.27E+01 | | 3.13E+01 |
| | | 121.78 | | 28.40 | -1.13E+00 | | 1.18E+01 |
| | | 244.69 | | 7.51 | -6.50E+01 | | 4.89E+01 |
| | | 344.29 | | 26.60 | 9.54E+00 | | 1.39E+01 |
| | | 411.12 | | 2.23 | -1.95E+00 | | 1.65E+02 |
| | | 443.89 | | 2.80 | -4.08E+01 | | 1.40E+02 |
| | | 778.92 | | 12.98 | -3.57E+01 | | 3.94E+01 |
| | | 867.38 | | 4.21 | 2.37E+00 | | 9.44E+01 |
| | | 964.11 | | 14.50 | 9.88E+00 | | 2.20E+01 |
| | | 1085.89 | | 9.94 | 4.20E+00 | | 2.79E+01 |

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 1089.71 | | 1.71 | -5.53E+01 | | 1.61E+02 |
| | | 1112.07 | | 13.60 | -2.94E+00 | | 1.91E+01 |
| | | 1212.93 | | 1.40 | -1.54E+02 | | 1.77E+02 |
| | | 1299.16 | | 1.63 | -1.46E+02 | | 1.33E+02 |
| | | 1408.00 | | 20.80 | -5.20E+00 | | 9.83E+00 |
| | EU-154 | 123.10 | | 40.50 | -5.11E-01 | 6.29E+00 | 8.21E+00 |
| | | 723.36 | | 19.70 | -9.71E+00 | | 2.29E+01 |
| | | 873.23 | | 11.45 | -4.96E+01 | | 3.51E+01 |
| | | 1004.78 | | 17.90 | -4.02E+02 | | 8.72E+01 |
| | | 1274.54 | | 35.50 | 1.04E-02 | | 6.29E+00 |
| | EU-155 | 86.54 | | 34.00 | -4.16E+02 | 1.77E+01 | 1.77E+01 |
| | | 105.31 | | 20.60 | -7.03E+02 | | 2.42E+01 |
| | PB-212 | 74.81 | | 10.50 | 7.34E+01 | 2.88E+01 | 4.02E+01 |
| | | 77.11 | | 17.70 | -2.59E+02 | | 2.88E+01 |
| | | 87.19 | | 6.27 | -2.25E+03 | | 9.76E+01 |
| | RA-226d | 186.11 | | 3.28 | -4.08E+01 | 9.00E+00 | 3.56E+02 |
| | | 241.92 | | 7.46 | -6.93E+00 | | 4.93E+01 |
| | | 295.09 | | 19.20 | 1.78E+01 | | 1.88E+01 |
| | | 351.87 | | 37.10 | -5.96E+00 | | 9.90E+00 |
| | | 609.31 | | 46.10 | 3.18E+00 | | 9.00E+00 |
| | | 1120.27 | | 15.00 | 2.10E+00 | | 1.85E+01 |
| | | 1764.49 | | 15.90 | 6.76E+01 | | 1.49E+01 |
| | TH-232d | 238.58 | | 43.60 | 7.03E+00 | 8.47E+00 | 8.47E+00 |
| | | 338.42 | | 12.40 | 1.09E+01 | | 2.97E+01 |
| | | 583.02 | | 30.87 | 1.97E+00 | | 1.35E+01 |
| | | 911.16 | | 29.00 | -8.06E+00 | | 1.18E+01 |
| | | 968.97 | | 17.40 | -4.58E+00 | | 1.83E+01 |
| + | U-235 | 143.79 | * | 10.50 | 1.97E+03 | 1.28E+01 | 4.07E+01 |
| | | 163.38 | * | 4.70 | 2.78E+03 | | 9.79E+01 |
| | | 185.74 | * | 53.00 | 3.10E+03 | | 1.28E+01 |
| | | 205.33 | * | 4.70 | 3.47E+03 | | 9.21E+01 |
| + | U-238d | 63.29 | * | 3.80 | 2.43E+04 | 9.84E+01 | 1.47E+02 |
| | | 92.56 | * | 5.41 | 4.28E+04 | | 9.84E+01 |
| | AM-241 | 59.54 | | 35.70 | -1.68E+02 | 1.10E+01 | 1.10E+01 |
| | CM-243 | 99.52 | | 14.40 | -6.02E+01 | 2.23E+01 | 5.88E+01 |
| | | 103.73 | | 23.00 | -7.83E+02 | | 2.23E+01 |
| | | 116.93 | | 8.32 | -2.53E+01 | | 5.46E+01 |
| | | 228.19 | | 10.56 | -7.34E+00 | | 3.58E+01 |
| | | 277.60 | | 14.00 | 4.45E+01 | | 2.62E+01 |
| | CM-245 | 99.52 | | 21.10 | -4.11E+01 | 1.53E+01 | 4.01E+01 |
| | | 103.73 | | 33.60 | -5.36E+02 | | 1.53E+01 |
| | | 116.93 | | 12.20 | -1.73E+01 | | 3.72E+01 |
| | | 174.94 | | 9.50 | 5.76E+00 | | 4.16E+01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Analysis Report for RCF19364

J16DW8 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

Reviewed and Approved: Edward S. Wallace, Edward S Wallace 4-02-08
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19365 |
| Sample Description | : J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 4.300E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 9:25:00AM |
| Acquisition Started | : 3/31/2008 11:31:07AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3662.9 seconds |
| Dead Time | : 1.72 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 50g Pill Box 1-10-2008 |
| Sample Number | : 18287 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| K-40 | 0.993 | 1.54E+01 | 3.45E+00 | |
| PB-212 | 0.709 | 8.25E-01 | 1.84E-01 | |
| RA-226d | 0.671 | 3.19E-01 | 1.65E-01 | |
| TH-232d | 0.850 | 6.67E-01 | 1.86E-01 | |
| U-235 | 0.547 | 6.08E-01 | 1.73E-01 | |
| U-238d @ | 1.000 | 8.52E+00 | 2.02E+00 | |

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 12:32:24PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
NP = No Peak
UK = Unknown
Errors quoted at 2.000 sigma

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.54E+01 | 3.26E+00 | 3.26E+00 |
| | CO-60 | 1173.24 | | 99.90 | -6.34E-02 | 3.47E-01 | 3.47E-01 |
| | | 1332.50 | | 99.98 | 3.75E-02 | | 3.60E-01 |
| | NB-94 | 702.63 | | 99.81 | 7.05E-02 | 2.58E-01 | 2.58E-01 |
| | | 871.10 | | 99.89 | 1.41E-02 | | 2.63E-01 |
| | AG-108m | 433.94 | | 90.50 | 1.28E-01 | 2.28E-01 | 2.28E-01 |
| | | 614.28 | | 89.80 | -1.16E-01 | | 3.23E-01 |
| | | 722.94 | | 90.80 | 1.29E-01 | | 2.82E-01 |
| | CS-137 | 661.66 | | 85.21 | 3.89E-02 | 3.02E-01 | 3.02E-01 |
| | EU-152 | 40.12 | | 38.40 | 7.17E-03 | 3.96E-01 | 3.96E-01 |
| | | 45.38 | | 11.10 | 3.69E-01 | | 1.26E+00 |
| | | 121.78 | | 28.40 | 1.98E-01 | | 4.43E-01 |
| | | 244.69 | | 7.51 | -2.24E+00 | | 2.30E+00 |
| | | 344.29 | | 26.60 | -2.47E-01 | | 7.72E-01 |
| | | 411.12 | | 2.23 | 3.66E+00 | | 9.37E+00 |
| | | 443.89 | | 2.80 | -4.69E+00 | | 6.69E+00 |
| | | 778.92 | | 12.98 | 1.69E-01 | | 1.93E+00 |
| | | 867.38 | | 4.21 | 4.44E+00 | | 7.05E+00 |

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | -1.96E-01 | | 2.38E+00 |
| | | 1085.89 | | 9.94 | -1.35E+00 | | 3.24E+00 |
| | | 1089.71 | | 1.71 | -4.04E+00 | | 1.97E+01 |
| | | 1112.07 | | 13.60 | -1.25E+00 | | 2.56E+00 |
| | | 1212.93 | | 1.40 | -1.72E+01 | | 2.31E+01 |
| | | 1299.16 | | 1.63 | 1.26E+01 | | 2.33E+01 |
| | | 1408.00 | | 20.80 | 8.27E-02 | | 1.62E+00 |
| | EU-154 | 123.10 | | 40.50 | 3.69E-02 | 3.07E-01 | 3.07E-01 |
| | | 723.36 | | 19.70 | 3.13E-01 | | 1.29E+00 |
| | | 873.23 | | 11.45 | -1.14E+00 | | 2.36E+00 |
| | | 1004.78 | | 17.90 | 1.55E+00 | | 1.81E+00 |
| | | 1274.54 | | 35.50 | 4.97E-01 | | 1.02E+00 |
| | EU-155 | 86.54 | | 34.00 | -5.02E-02 | 4.17E-01 | 4.17E-01 |
| | | 105.31 | | 20.60 | 2.65E-01 | | 6.12E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.17E+00 | 4.12E-01 | 7.22E-01 |
| | | 77.11 | * | 17.70 | 7.21E-01 | | 4.12E-01 |
| | | 87.19 | | 6.27 | 6.20E-02 | | 2.35E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 1.01E+01 | 3.68E-01 | 3.82E+00 |
| | | 241.92 | | 7.46 | -9.30E-01 | | 3.00E+00 |
| | | 295.09 | * | 19.20 | 5.92E-01 | | 6.49E-01 |
| | | 351.87 | * | 37.10 | 3.03E-01 | | 3.68E-01 |
| | | 609.31 | * | 46.10 | 2.24E-01 | | 4.52E-01 |
| | | 1120.27 | | 15.00 | 9.26E-01 | | 2.51E+00 |
| | | 1764.49 | | 15.90 | 1.11E+00 | | 2.38E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 5.99E-01 | 3.54E-01 | 3.54E-01 |
| | | 338.42 | * | 12.40 | 5.99E-01 | | 9.72E-01 |
| | | 583.02 | * | 30.87 | 8.64E-01 | | 5.68E-01 |
| | | 911.16 | * | 29.00 | 7.32E-01 | | 8.91E-01 |
| | | 968.97 | | 17.40 | 1.63E+00 | | 1.97E+00 |
| + | U-235 | 143.79 | | 10.50 | 9.67E-01 | 2.37E-01 | 1.34E+00 |
| | | 163.38 | | 4.70 | 5.41E-02 | | 2.95E+00 |
| | | 185.74 | * | 53.00 | 6.28E-01 | | 2.37E-01 |
| | | 205.33 | | 4.70 | 6.04E-02 | | 3.52E+00 |
| + | U-238d | 63.29 | * | 3.80 | 8.52E+00 | 2.10E+00 | 2.72E+00 |
| | | 92.56 | * | 5.41 | 1.05E+01 | | 2.10E+00 |
| | AM-241 | 59.54 | | 35.70 | -7.91E-02 | 4.35E-01 | 4.35E-01 |
| | CM-243 | 99.52 | | 14.40 | -6.09E-01 | 5.40E-01 | 8.73E-01 |
| | | 103.73 | | 23.00 | -4.32E-01 | | 5.40E-01 |
| | | 116.93 | | 8.32 | -1.89E-01 | | 1.52E+00 |
| | | 228.19 | | 10.56 | -8.73E-02 | | 1.51E+00 |
| | | 277.60 | | 14.00 | -1.06E+00 | | 1.15E+00 |
| | CM-245 | 99.52 | | 21.10 | -4.16E-01 | 3.70E-01 | 5.95E-01 |
| | | 103.73 | | 33.60 | -2.96E-01 | | 3.70E-01 |
| | | 116.93 | | 12.20 | -1.29E-01 | | 1.03E+00 |
| | | 174.94 | | 9.50 | 7.00E-01 | | 1.49E+00 |

Analysis Report for RCF19365

J16DW9 SAF:RC-087 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: Edward S. Wallace, Edward S. Wallace 4-02-08
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19362 |
| Sample Description | : J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.600E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 10:05:00AM |
| Acquisition Started | : 3/31/2008 10:21:24AM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3662.3 seconds |
| Dead Time | : 1.70 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18283 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.989 | 1.26E+01 | 2.56E+00 | |
| CS-137 | | 0.990 | 5.17E-01 | 1.42E-01 | |
| PB-212 | | 0.707 | 1.15E+00 | 2.32E-01 | |
| RA-226d | | 0.786 | 3.96E-01 | 1.43E-01 | |
| TH-232d | | 0.751 | 6.04E-01 | 1.89E-01 | |
| U-235 | | 0.999 | 2.92E+00 | 4.68E-01 | |
| U-238d | @ | 1.000 | 5.61E+01 | 4.74E+00 | |

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 11:22:29AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| M | 4 | 84.05 | NP | 6.23E-02 | 9.71 |
| m | 5 | 89.94 | NP | 3.91E-02 | 13.29 |
| m | 7 | 98.34 | NP | 4.27E-02 | 10.87 |
| | 8 | 112.73 | NP | 4.41E-02 | 20.15 |
| | 21 | 1000.59 | Pa-234m | 2.00E-02 | 15.11 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.26E+01 | 2.25E+00 | 2.25E+00 |
| | CO-60 | 1173.24 | | 99.90 | -2.45E-02 | 1.96E-01 | 2.59E-01 |
| | | 1332.50 | | 99.98 | -1.00E-01 | | 1.96E-01 |
| | NB-94 | 702.63 | | 99.81 | 1.32E-01 | 2.09E-01 | 2.09E-01 |
| | | 871.10 | | 99.89 | 1.37E-01 | | 2.22E-01 |
| | AG-108m | 433.94 | | 90.50 | 7.27E-02 | 1.70E-01 | 1.70E-01 |
| | | 614.28 | | 89.80 | -2.75E-01 | | 2.59E-01 |
| | | 722.94 | | 90.80 | 6.49E-02 | | 2.21E-01 |
| + | CS-137 | 661.66 | * | 85.21 | 5.17E-01 | 1.65E-01 | 1.65E-01 |
| | EU-152 | 40.12 | | 38.40 | 7.23E-02 | 3.39E-01 | 3.39E-01 |
| | | 45.38 | | 11.10 | -1.24E-01 | | 1.23E+00 |
| | | 121.78 | | 28.40 | 1.68E-01 | | 4.18E-01 |
| | | 244.69 | | 7.51 | -2.12E+00 | | 1.72E+00 |
| | | 344.29 | | 26.60 | 3.21E-01 | | 5.91E-01 |

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 411.12 | | 2.23 | 2.59E+00 | | 6.95E+00 |
| | | 443.89 | | 2.80 | -6.41E-01 | | 5.54E+00 |
| | | 778.92 | | 12.98 | -6.42E-01 | | 1.31E+00 |
| | | 867.38 | | 4.21 | -2.91E-01 | | 5.41E+00 |
| | | 964.11 | | 14.50 | -3.82E-01 | | 1.96E+00 |
| | | 1085.89 | | 9.94 | -3.39E-01 | | 2.52E+00 |
| | | 1089.71 | | 1.71 | 1.54E+00 | | 1.44E+01 |
| | | 1112.07 | | 13.60 | -2.31E+00 | | 1.91E+00 |
| | | 1212.93 | | 1.40 | 1.41E+00 | | 1.87E+01 |
| | | 1299.16 | | 1.63 | 5.64E+00 | | 1.42E+01 |
| | | 1408.00 | | 20.80 | 4.41E-01 | | 8.51E-01 |
| | EU-154 | 123.10 | | 40.50 | 2.87E-01 | 2.96E-01 | 2.96E-01 |
| | | 723.36 | | 19.70 | 2.92E-01 | | 1.02E+00 |
| | | 873.23 | | 11.45 | 1.02E+00 | | 1.94E+00 |
| | | 1004.78 | | 17.90 | 3.21E+00 | | 1.99E+00 |
| | | 1274.54 | | 35.50 | -1.02E-01 | | 6.84E-01 |
| | EU-155 | 86.54 | | 34.00 | -8.75E+00 | 5.73E-01 | 5.73E-01 |
| | | 105.31 | | 20.60 | -4.12E-01 | | 6.23E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.48E+00 | 5.78E-01 | 9.91E-01 |
| | | 77.11 | * | 17.70 | 1.03E+00 | | 5.78E-01 |
| | | 87.19 | | 6.27 | -1.16E+02 | | 3.26E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 5.35E+01 | 3.17E-01 | 3.59E+00 |
| | | 241.92 | | 7.46 | -3.96E-01 | | 2.33E+00 |
| | | 295.09 | * | 19.20 | 5.83E-01 | | 4.82E-01 |
| | | 351.87 | * | 37.10 | 3.08E-01 | | 3.28E-01 |
| | | 609.31 | * | 46.10 | 3.69E-01 | | 3.17E-01 |
| | | 1120.27 | * | 15.00 | 7.87E-01 | | 9.38E-01 |
| | | 1764.49 | | 15.90 | 9.85E-02 | | 1.12E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 6.43E-01 | 2.16E-01 | 2.16E-01 |
| | | 338.42 | * | 12.40 | 5.79E-01 | | 8.81E-01 |
| | | 583.02 | * | 30.87 | 5.39E-01 | | 3.96E-01 |
| | | 911.16 | | 29.00 | 4.58E-01 | | 9.05E-01 |
| | | 968.97 | * | 17.40 | 8.12E-01 | | 9.56E-01 |
| + | U-235 | 143.79 | * | 10.50 | 2.86E+00 | 2.22E-01 | 9.08E-01 |
| | | 163.38 | * | 4.70 | 3.94E+00 | | 2.58E+00 |
| | | 185.74 | * | 53.00 | 3.31E+00 | | 2.22E-01 |
| | | 205.33 | * | 4.70 | 1.35E+00 | | 2.21E+00 |
| + | U-238d | 63.29 | * | 3.80 | 5.61E+01 | 1.71E+00 | 3.94E+00 |
| | | 92.56 | * | 5.41 | 5.14E+01 | | 1.71E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.99E-01 | 7.25E-01 | 7.25E-01 |
| | CM-243 | 99.52 | | 14.40 | -5.68E-01 | 5.46E-01 | 9.95E-01 |
| | | 103.73 | | 23.00 | -1.30E+00 | | 5.46E-01 |
| | | 116.93 | | 8.32 | -7.67E-01 | | 1.64E+00 |
| | | 228.19 | | 10.56 | 4.11E-02 | | 1.16E+00 |
| | | 277.60 | | 14.00 | 1.46E-01 | | 8.95E-01 |
| | CM-245 | 99.52 | | 21.10 | -3.88E-01 | 3.74E-01 | 6.79E-01 |
| | | 103.73 | | 33.60 | -8.87E-01 | | 3.74E-01 |
| | | 116.93 | | 12.20 | -5.23E-01 | | 1.12E+00 |

Analysis Report for RCF19362

J16DX0 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|
| | 174.94 | 9.50 | 3.62E-01 | | 1.35E+00 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: Edward S. Wallace, Edward S Wallace 4-02-08
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19363 |
| Sample Description | : J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 7.400E+01 grams |
| Facility | : Default |
| Sample Taken On | : 3/28/2008 10:10:00AM |
| Acquisition Started | : 3/31/2008 10:21:33AM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.8 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/5/2008 |
| Efficiency Calibration Description | : 80g Pill box 2/5/2008 |
| Sample Number | : 18284 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| K-40 | 0.999 | 1.29E+01 | 3.63E+00 | |
| CS-137 | 0.998 | 6.92E-01 | 1.73E-01 | |
| PB-212 | 0.707 | 1.02E+00 | 2.24E-01 | |
| RA-226d | 0.404 | 2.97E-01 | 1.51E-01 | |
| TH-232d | 0.996 | 4.59E-01 | 1.42E-01 | |
| U-235 | 0.999 | 3.29E+00 | 5.85E-01 | |
| U-238d @ | 1.000 | 4.35E+01 | 5.24E+00 | |

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 3/31/2008 11:21:43AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 4 | 84.37 | Th-231 | 7.33E-02 | 18.72 |
| M | 5 | 89.95 | Ac-228 | 3.38E-02 | 17.31 |
| | 7 | 98.45 | Pa-234 | 3.75E-02 | 31.93 |
| M | 8 | 109.39 | NP | 1.26E-02 | 35.06 |
| m | 9 | 112.61 | NP | 5.65E-02 | 11.05 |
| | 20 | 766.63 | NP | 1.24E-02 | 26.69 |
| | 23 | 1001.17 | Pu-234m | 1.78E-02 | 18.66 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.29E+01 | 2.04E+00 | 2.04E+00 |
| | CO-60 | 1173.24 | | 99.90 | -3.80E-02 | 1.70E-01 | 2.01E-01 |
| | | 1332.50 | | 99.98 | -2.58E-02 | | 1.70E-01 |
| | NB-94 | 702.63 | | 99.81 | 1.11E-01 | 1.59E-01 | 1.79E-01 |
| | | 871.10 | | 99.89 | -3.47E-02 | | 1.59E-01 |
| | AG-108m | 433.94 | | 90.50 | -8.21E-03 | 1.39E-01 | 1.39E-01 |
| | | 614.28 | | 89.80 | 5.82E-02 | | 1.83E-01 |
| | | 722.94 | | 90.80 | 4.28E-02 | | 2.03E-01 |
| + | CS-137 | 661.66 | * | 85.21 | 6.92E-01 | 2.03E-01 | 2.03E-01 |
| | EU-152 | 40.12 | | 38.40 | -2.01E-01 | 3.49E-01 | 3.49E-01 |
| | | 45.38 | | 11.10 | -4.89E-01 | | 1.20E+00 |
| | | 121.78 | | 28.40 | 2.77E-01 | | 3.69E-01 |

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 244.69 | | 7.51 | 3.10E-01 | | 1.39E+00 |
| | | 344.29 | | 26.60 | -6.96E-02 | | 4.06E-01 |
| | | 411.12 | | 2.23 | -9.82E-02 | | 5.16E+00 |
| | | 443.89 | | 2.80 | -2.26E+00 | | 4.29E+00 |
| | | 778.92 | | 12.98 | -1.43E+00 | | 1.24E+00 |
| | | 867.38 | | 4.21 | -1.44E+00 | | 3.71E+00 |
| | | 964.11 | | 14.50 | -9.50E-01 | | 1.65E+00 |
| | | 1085.89 | | 9.94 | 1.11E+00 | | 2.11E+00 |
| | | 1089.71 | | 1.71 | 1.01E-01 | | 1.13E+01 |
| | | 1112.07 | | 13.60 | -3.86E-01 | | 1.53E+00 |
| | | 1212.93 | | 1.40 | -1.99E-01 | | 1.53E+01 |
| | | 1299.16 | | 1.63 | 4.90E+00 | | 1.27E+01 |
| | | 1408.00 | | 20.80 | 1.42E-01 | | 8.52E-01 |
| | EU-154 | 123.10 | | 40.50 | 1.46E-03 | 2.54E-01 | 2.54E-01 |
| | | 723.36 | | 19.70 | 1.97E-01 | | 9.39E-01 |
| | | 873.23 | | 11.45 | -6.27E-01 | | 1.36E+00 |
| | | 1004.78 | | 17.90 | -1.17E-02 | | 1.68E+00 |
| | | 1274.54 | | 35.50 | -5.78E-02 | | 5.49E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.54E-02 | 4.89E-01 | 4.89E-01 |
| | | 105.31 | | 20.60 | 1.81E-01 | | 5.32E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.26E+00 | 6.84E-01 | 1.14E+00 |
| | | 77.11 | * | 17.70 | 9.24E-01 | | 6.84E-01 |
| | | 87.19 | | 6.27 | -8.33E-02 | | 2.70E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 5.28E+01 | 3.16E-01 | 3.25E+00 |
| | | 241.92 | | 7.46 | 7.83E-01 | | 1.99E+00 |
| | | 295.09 | | 19.20 | 2.39E-01 | | 5.57E-01 |
| | | 351.87 | * | 37.10 | 2.75E-01 | | 3.16E-01 |
| | | 609.31 | * | 46.10 | 3.19E-01 | | 3.24E-01 |
| | | 1120.27 | | 15.00 | 7.37E-01 | | 1.53E+00 |
| | | 1764.49 | | 15.90 | 1.03E+00 | | 1.43E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 4.41E-01 | 2.83E-01 | 2.83E-01 |
| | | 338.42 | * | 12.40 | 4.26E-01 | | 8.74E-01 |
| | | 583.02 | * | 30.87 | 4.39E-01 | | 3.53E-01 |
| | | 911.16 | * | 29.00 | 4.44E-01 | | 5.83E-01 |
| | | 968.97 | * | 17.40 | 7.09E-01 | | 8.04E-01 |
| + | U-235 | 143.79 | * | 10.50 | 3.08E+00 | 2.01E-01 | 9.77E-01 |
| | | 163.38 | * | 4.70 | 3.37E+00 | | 2.40E+00 |
| | | 185.74 | * | 53.00 | 3.27E+00 | | 2.01E-01 |
| | | 205.33 | * | 4.70 | 4.13E+00 | | 1.96E+00 |
| + | U-238d | 63.29 | * | 3.80 | 4.35E+01 | 2.41E+00 | 4.23E+00 |
| | | 92.56 | * | 5.41 | 4.46E+01 | | 2.41E+00 |
| | AM-241 | 59.54 | | 35.70 | -3.69E-02 | 3.89E-01 | 3.89E-01 |
| | CM-243 | 99.52 | | 14.40 | -6.07E-02 | 4.70E-01 | 9.28E-01 |
| | | 103.73 | | 23.00 | -1.46E-01 | | 4.70E-01 |
| | | 116.93 | | 8.32 | -9.29E-01 | | 1.34E+00 |
| | | 228.19 | | 10.56 | -4.29E-01 | | 8.74E-01 |
| | | 277.60 | | 14.00 | -4.97E-02 | | 7.01E-01 |
| | CM-245 | 99.52 | | 21.10 | -4.14E-02 | 3.22E-01 | 6.33E-01 |

Analysis Report for RCF19363

J16DX1 SAF-RC-087 FF2-618-7 BG/STOCKPILES

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|
| | 103.73 | 33.60 | -1.00E-01 | | 3.22E-01 |
| | 116.93 | 12.20 | -6.34E-01 | | 9.11E-01 |
| | 174.94 | 9.50 | -1.21E-01 | | 9.79E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: Edward S. Wallace, Edward S. Wallace 4-02-08
(print/sign/date)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# Sample Check-in List

Date/Time Received: 4 3 08 1030 GM Screen Result 0.1K

Client: WCH SDG #: J00166 NA[ ] SAF #: RC-087 NA[ ]

Work Order Number: J8D030231 Chain of Custody # RC-087-059,-060

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? NA [ ] Yes [✓] No [ ]
4. Cooler Temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ____ Tape
   - ✓ Custody Seals
   - ____ Hazard Lables
   - ✓ Appropriate Sample Lables
9. Samples are:
   - ✓ In Good Condition
   - ____ Broken
   - ____ Leaking
   - ____ Have Air Bubbles
   - (Only for samples requiring no head space.)
10. Sample pH taken? NA [✓] SOIL pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount $HNO_3$ Added _____
11. Sample Location, Sample Collector Listed? *
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: _____ Date: 4 3 08

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person Contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

J8D070175 J00166 DUR 4 8 08

TESTAMERICA

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-061 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: B Lawrence, E. Harries | Company Contact: Joan Kessner — Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH | Price Code: 2B — Data Turnaround: 24 Hours |
| Project Designation: 618-7 Burial Ground - Soil | Sampling Location: 618-7 Burial Ground/Stockpiles | SAF No.: RC-087 | |
| Ice Chest No.: Elc-99-051 | Field Logbook No.: EL-1395-12 — COA: RG61872600 | Method of Shipment: Government Vehicle - Hand Delivery | |
| Shipped To: TestAmerica Incorporated, Richland | Offsite Property No.: N/A | Bill of Lading/Air Bill No.: N/A | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | | |
| Type of Container | P | | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| J16J24 KKT7H | SOIL | 4-2-08 | 0745 | X | | | | | J16J22 | | | SEA F007 |
| J16J25 KKT7K | SOIL | 4-2-08 | 0745 | X | | | | | J16J23 | | | " F007B |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From: Blawrena | Date/Time: 0930 4-2-08 | Received By/Stored In: RT Coffman/RT Coffman | Date/Time: 0930 4/2/08 |
| Relinquished By/Removed From: RT Coffman/RT Coffman | Date/Time: 1000 4/2/08 | Received By/Stored In: David Stump | Date/Time: 4/2/08 1000 |
| Relinquished By/Removed From: David Stump | Date/Time: 4/2/08 1050 | Received By/Stored In: LULANE TALR | Date/Time: 1050 4 7 08 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

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J8D070175 J001166 DUE 4808

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-075 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: B Lawrence, E. Harries | Company Contact: Joan Kessner | Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 2B | Data Turnaround: 24 Hours | | |
| Project Designation: 618-7 Burial Ground - Soil | Sampling Location: 618-7 Burial Ground/Stockpiles | | SAF No.: RC-087 |
| Ice Chest No.: ERC-99-051 | Field Logbook No.: EL-1395-12 | COA: RG61872600 | Method of Shipment: Govt Vehicle - Hand Delivery |
| Shipped To: TestAmerica Incorporated, Richland | Offsite Property No.: N/A | | Bill of Lading/Air Bill No.: N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | RCF | | | |
| • J16J53 KKT7M | SOIL | 4-2-08 | 0715 | X | | | | J16J53 | | | SEG F001 |
| • J16J54 KKT7Q | SOIL | 4-2-08 | 0720 | X | | | | J16J54 | | | " F002 |
| J16J55 KKT7R | SOIL | 4-2-08 | 0725 | X | | | | J16J55 | | | " F003 |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From: B Lawrence | Date/Time: 0930 4-2-08 | Received By/Stored In: RT COFFMAN / RT Coffman |
| Relinquished By/Removed From: RT COFFMAN / RT Coffman | Date/Time: 1000 4/2/08 | Received By/Stored In: Bruce St John / Bruce St John |
| Relinquished By/Removed From: Bruce St John / Bruce St John | Date/Time: 4/2/08 1050 | Received By/Stored In: RJ LJ LANE TALR 4708 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In |
| Relinquished By/Removed From | Date/Time | Received By/Stored In |
| Relinquished By/Removed From | Date/Time | Received By/Stored In |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

Matrix *
S=Soil
SE=Sediment
SO=Solid
SJ=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

TESTAMERICA

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J8D070175 J00166 DUE 4 8 08

TESTAMERICA

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-076 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: B Lawrence, E. Harries | Company Contact: Joan Kessner | Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 2B | Data Turnaround: 24 Hours | | |
| Project Designation: 618-7 Burial Ground - Soil | Sampling Location: 618-7 Burial Ground/Stockpiles | | SAF No.: RC-087 |
| Ice Chest No.: ERC-99-051 | Field Logbook No.: EL-1395-12 | COA: RG61872600 | Method of Shipment: Gov't Vehicle - Hand Delivery |
| Shipped To: TestAmerica Incorporated, Richland | Offsite Property No.: N/A | | Bill of Lading/Air Bill No.: N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J16J56 KKT7T | SOIL | 4-2-08 | 0730 | X | | | | J16J36 | | | | SEE | F004 |
| J16J57 KKT7V | SOIL | 4-2-08 | 0735 | X | | | | J16J37 | | | | " | F005 |
| J16J58 KKT7W | SOIL | 4-2-08 | 0740 | X | | | | J16J38 | | | | " | F006 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From: Blaurence | Date/Time: 0930 4-2-08 | Received By/Stored In: RT COFFMAN/RT Coffman |
| Relinquished By/Removed From: RT COFFMAN/RT Coffman | Date/Time: 1000 4/2/08 | Received By/Stored In: [illegible] |
| Relinquished By/Removed From: [illegible] | Date/Time: 4/2/08 1050 | Received By/Stored In: [illegible] LANE TALR 4/2/08 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In |
| Relinquished By/Removed From | Date/Time | Received By/Stored In |
| Relinquished By/Removed From | Date/Time | Received By/Stored In |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]; Metals by ICP - 6010 - Quick Turn (Add On) [Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium]

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

J8D070175 J00166 DUE 4 8 08

TESTAMERICA

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-077 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: B Lawrence, E. Harries | Company Contact: Joan Kessner | Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 2B | Data Turnaround: 24 Hours | | |
| Project Designation: 618-7 Burial Ground - Soil | Sampling Location: 618-7 Burial Ground/Stockpiles | | SAF No.: RC-087 |
| Ice Chest No.: ERC-99-051 | Field Logbook No.: EL-1395-12 | COA: RG61872600 | Method of Shipment: Govt Vehicle - Hand Delivery |
| Shipped To: TestAmerica Incorporated, Richland | Offsite Property No.: N/A | | Bill of Lading/Air Bill No.: N/A |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J16J59 KKT71 | SOIL | 4/3/08 | 0715 | X | | | | J16J39 | | | | See | G-001 |
| J16J60 KKT73 | SOIL | 4/3/08 | 0725 | X | | | | J16J40 | | | | " | G-002 |
| J16J61 KKT75 | SOIL | 4/3/08 | 0735 | X | | | | J16J41 | | | | " | G-003 |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From: Blawrence | Date/Time: 0815 4-3-08 | Received By/Stored In: RT Coffman / RT Coffman | Date/Time: 0815 4/3/08 |
| Relinquished By/Removed From: RT Coffman / RT Coffman | Date/Time: 1030 4/7/08 | Received By/Stored In: W. D. St. John | Date/Time: 4/7/08 1030 |
| Relinquished By/Removed From: W. D. St. John | Date/Time: 4/7/08 1050 | Received By/Stored In: RJ Lanethalr | Date/Time: 4 7 08 1050 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date Time |

WCH-EE-011

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**Radiological Counting Facility**

Analysis Report for RCF19374

J16J22 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19374 |
| Sample Description | : J16J22 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 5.700E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:45:00AM |
| Acquisition Started | : 4/2/2008 11:34:17AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3648.2 seconds |
| Dead Time | : 1.32 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 50g Pill Box 1-10-2008 |
| Sample Number | : 18362 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.999 | 1.38E+01 | 2.83E+00 | |
| PB-212 | | 0.710 | 7.62E-01 | 1.52E-01 | |
| RA-226d | | 0.616 | 3.26E-01 | 1.49E-01 | |
| TH-232d | | 0.744 | 6.44E-01 | 1.54E-01 | |
| U-238d | @ | 0.999 | 1.45E+00 | 1.34E+00 | |

Analysis Report for RCF19374

J16J22 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium

Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 12:35:15PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|
| 9 | 510.87 Annihilation photon | 8.66E-03 | 59.10 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.38E+01 | 2.63E+00 | 2.63E+00 |
| | CO-60 | ~~1173.24~~ | | 99.90 | 9.33E-02 | ~~2.47E-01~~ | 2.83E-01 |
| | | 1332.50 | | 99.98 | -1.31E-01 | | 2.47E-01 |
| | NB-94 | 702.63 | | 99.81 | 7.98E-02 | 2.15E-01 | 2.28E-01 |
| | | 871.10 | | 99.89 | 5.19E-03 | | 2.15E-01 |
| | AG-108m | 433.94 | | 90.50 | 3.78E-02 | 1.78E-01 | 1.78E-01 |
| | | 614.28 | | 89.80 | -1.17E-02 | | 3.07E-01 |
| | | 722.94 | | 90.80 | 2.03E-01 | | 2.65E-01 |
| | CS-137 | 661.66 | | 85.21 | -5.89E-04 | 2.36E-01 | 2.36E-01 |
| | EU-152 | 40.12 | | 38.40 | 7.17E-02 | 2.87E-01 | 2.87E-01 |
| | | 45.38 | | 11.10 | 1.86E-01 | | 9.13E-01 |
| | | 121.78 | | 28.40 | 1.04E-01 | | 3.11E-01 |
| | | 244.69 | | 7.51 | -8.03E-01 | | 1.69E+00 |
| | | 344.29 | | 26.60 | -2.67E-01 | | 5.91E-01 |
| | | 411.12 | | 2.23 | -2.25E+00 | | 7.10E+00 |
| | | 443.89 | | 2.80 | -1.99E+00 | | 5.88E+00 |
| | | 778.92 | | 12.98 | 6.70E-02 | | 1.47E+00 |
| | | 867.38 | | 4.21 | 2.03E+00 | | 5.77E+00 |
| | | 964.11 | | 14.50 | 6.63E-01 | | 2.15E+00 |

Analysis Report for RCF19374

J16J22 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 1085.89 | | 9.94 | 2.88E-01 | | 2.62E+00 |
| | | 1089.71 | | 1.71 | 5.06E+00 | | 1.54E+01 |
| | | 1112.07 | | 13.60 | -2.25E+00 | | 1.98E+00 |
| | | 1212.93 | | 1.40 | -8.25E+00 | | 1.92E+01 |
| | | 1299.16 | | 1.63 | -6.64E+00 | | 1.63E+01 |
| | | 1408.00 | | 20.80 | 4.79E-01 | | 1.19E+00 |
| | EU-154 | 123.10 | | 40.50 | -1.65E-01 | 2.15E-01 | 2.15E-01 |
| | | 723.36 | | 19.70 | 8.33E-01 | | 1.22E+00 |
| | | 873.23 | | 11.45 | -2.47E+00 | | 1.81E+00 |
| | | 1004.78 | | 17.90 | -7.45E-02 | | 1.13E+00 |
| | | 1274.54 | | 35.50 | -8.43E-01 | | 8.50E-01 |
| | EU-155 | 86.54 | | 34.00 | 1.75E-02 | 3.21E-01 | 3.21E-01 |
| | | 105.31 | | 20.60 | 2.84E-01 | | 4.41E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 8.09E-01 | 3.12E-01 | 6.33E-01 |
| | | 77.11 | * | 17.70 | 7.43E-01 | | 3.12E-01 |
| | | 87.19 | | 6.27 | -5.80E-02 | | 1.74E+00 |
| + | RA-226d | 186.11 | | 3.28 | 2.45E+00 | 3.46E-01 | 3.93E+00 |
| | | 241.92 | | 7.46 | -1.98E-01 | | 2.39E+00 |
| | | 295.09 | * | 19.20 | 3.32E-01 | | 5.73E-01 |
| | | 351.87 | * | 37.10 | 2.27E-01 | | 3.69E-01 |
| | | 609.31 | * | 46.10 | 4.29E-01 | | 3.46E-01 |
| | | 1120.27 | | 15.00 | -2.59E-01 | | 2.07E+00 |
| | | 1764.49 | | 15.90 | 7.54E-01 | | 1.80E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 6.07E-01 | 2.95E-01 | 2.95E-01 |
| | | 338.42 | * | 12.40 | 7.58E-01 | | 9.15E-01 |
| | | 583.02 | * | 30.87 | 6.74E-01 | | 3.69E-01 |
| | | 911.16 | | 29.00 | 4.32E-01 | | 1.05E+00 |
| | | 968.97 | * | 17.40 | 7.11E-01 | | 9.02E-01 |
| | U-235 | 143.79 | | 10.50 | -5.27E-02 | 2.43E-01 | 9.42E-01 |
| | | 163.38 | | 4.70 | -1.11E-01 | | 2.24E+00 |
| | | 185.74 | | 53.00 | 1.52E-01 | | 2.43E-01 |
| | | 205.33 | | 4.70 | -2.69E-01 | | 2.63E+00 |
| + | U-238d | 63.29 | * | 3.80 | 1.45E+00 | 1.12E+00 | 2.17E+00 |
| | | 92.56 | * | 5.41 | 1.35E+00 | | 1.12E+00 |
| | AM-241 | 59.54 | | 35.70 | 9.14E-03 | 2.95E-01 | 2.95E-01 |
| | CM-243 | 99.52 | | 14.40 | -1.74E-01 | 3.85E-01 | 6.06E-01 |
| | | 103.73 | | 23.00 | -1.61E-02 | | 3.85E-01 |
| | | 116.93 | | 8.32 | 2.84E-01 | | 1.10E+00 |
| | | 228.19 | | 10.56 | 2.40E-01 | | 1.10E+00 |
| | | 277.60 | | 14.00 | 5.08E-01 | | 1.02E+00 |
| | CM-245 | 99.52 | | 21.10 | -1.19E-01 | 2.64E-01 | 4.14E-01 |
| | | 103.73 | | 33.60 | -1.10E-02 | | 2.64E-01 |
| | | 116.93 | | 12.20 | 1.94E-01 | | 7.49E-01 |
| | | 174.94 | | 9.50 | -1.39E-01 | | 1.18E+00 |

Analysis Report for RCF19374

J16J22 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
• = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 03 2008

(print/sign/date)

## Radiological Counting Facility

Analysis Report for RCF19375

J16J23 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19375 |
| Sample Description | : J16J23 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 5.500E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:45:00AM |
| Acquisition Started | : 4/2/2008 11:34:25AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/4/2008 |
| Efficiency Calibration Description | : 50ml Pill Box (1234-95-2) 2/4/2008 |
| Sample Number | : 18363 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 1.000 | 1.62E+01 | 3.48E+00 | |
| PB-212 | | 0.709 | 9.62E-01 | 2.17E-01 | |
| RA-226d | | 0.672 | 4.43E-01 | 2.05E-01 | |
| TH-232d | | 0.419 | 9.35E-01 | 2.44E-01 | |
| U-235 | | 0.540 | 3.77E-01 | 1.95E-01 | |
| U-238d | @ | 1.000 | 3.12E+00 | 1.96E+00 | |

Analysis Report for RCF19375

J16J23 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 12:34:36PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.62E+01 | 3.41E+00 | 3.41E+00 |
| | CO-60 | 1173.24 | | 99.90 | 1.08E-01 | 3.13E-01 | 3.33E-01 |
| | | 1332.50 | | 99.98 | -1.38E-01 | | 3.13E-01 |
| | NB-94 | 702.63 | | 99.81 | -2.97E-01 | 1.96E-01 | 1.96E-01 |
| | | 871.10 | | 99.89 | 3.18E-02 | | 2.98E-01 |
| | AG-108m | 433.94 | | 90.50 | 4.50E-02 | 2.17E-01 | 2.17E-01 |
| | | 614.28 | | 89.80 | 8.69E-02 | | 3.09E-01 |
| | | 722.94 | | 90.80 | 2.20E-01 | | 3.17E-01 |
| | CS-137 | 661.66 | | 85.21 | 1.74E-01 | 2.76E-01 | 2.76E-01 |
| | EU-152 | 40.12 | | 38.40 | -8.29E-02 | 3.13E-01 | 3.13E-01 |
| | | 45.38 | | 11.10 | 1.21E+00 | | 1.15E+00 |
| | | 121.78 | | 28.40 | 2.97E-02 | | 3.24E-01 |
| | | 244.69 | | 7.51 | 1.74E+00 | | 2.23E+00 |
| | | 344.29 | | 26.60 | -8.68E-01 | | 6.06E-01 |
| | | 411.12 | | 2.23 | 6.20E+00 | | 8.66E+00 |
| | | 443.89 | | 2.80 | -4.12E+00 | | 6.83E+00 |
| | | 778.92 | | 12.98 | 7.95E-01 | | 2.01E+00 |
| | | 867.38 | | 4.21 | -2.01E+00 | | 7.69E+00 |

Analysis Report for RCF19375

J16J23 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 1.33E+00 | | 2.22E+00 |
| | | 1085.89 | | 9.94 | -8.08E-01 | | 2.94E+00 |
| | | 1089.71 | | 1.71 | 1.14E+00 | | 1.72E+01 |
| | | 1112.07 | | 13.60 | -1.35E+00 | | 2.80E+00 |
| | | 1212.93 | | 1.40 | 4.11E+00 | | 2.72E+01 |
| | | 1299.16 | | 1.63 | -3.41E+00 | | 1.91E+01 |
| | | 1408.00 | | 20.80 | 2.21E-01 | | 1.35E+00 |
| | EU-154 | 123.10 | | 40.50 | -1.17E-01 | 2.23E-01 | 2.23E-01 |
| | | 723.36 | | 19.70 | 1.02E+00 | | 1.46E+00 |
| | | 873.23 | | 11.45 | 2.11E+00 | | 2.68E+00 |
| | | 1004.78 | | 17.90 | 6.98E-01 | | 1.61E+00 |
| | | 1274.54 | | 35.50 | -4.68E-01 | | 9.54E-01 |
| | EU-155 | 86.54 | | 34.00 | 2.24E-01 | 3.66E-01 | 3.66E-01 |
| | | 105.31 | | 20.60 | -3.40E-02 | | 4.41E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.21E+00 | 5.71E-01 | 9.73E-01 |
| | | 77.11 | * | 17.70 | 8.67E-01 | | 5.71E-01 |
| | | 87.19 | | 6.27 | 4.83E-01 | | 2.02E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 6.53E+00 | 4.87E-01 | 4.81E+00 |
| | | 241.92 | | 7.46 | 1.28E+00 | | 3.38E+00 |
| | | 295.09 | * | 19.20 | 4.42E-01 | | 6.20E-01 |
| | | 351.87 | * | 37.10 | 5.52E-01 | | 4.87E-01 |
| | | 609.31 | * | 46.10 | 2.97E-01 | | 6.06E-01 |
| | | 1120.27 | | 15.00 | 3.90E+00 | | 2.96E+00 |
| | | 1764.49 | | 15.90 | 2.17E+00 | | 2.62E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 1.13E+00 | 3.97E-01 | 3.97E-01 |
| | | 338.42 | | 12.40 | -1.31E-01 | | 1.52E+00 |
| | | 583.02 | * | 30.87 | 5.28E-01 | | 6.76E-01 |
| | | 911.16 | | 29.00 | 1.46E+00 | | 1.27E+00 |
| | | 968.97 | | 17.40 | 1.44E+00 | | 2.03E+00 |
| + | U-235 | 143.79 | | 10.50 | 3.38E-01 | 2.98E-01 | 1.11E+00 |
| | | 163.38 | | 4.70 | 9.36E-01 | | 2.54E+00 |
| | | 185.74 | * | 53.00 | 4.04E-01 | | 2.98E-01 |
| | | 205.33 | | 4.70 | -1.37E+00 | | 2.88E+00 |
| + | U-238d | 63.29 | * | 3.80 | 3.12E+00 | 2.15E+00 | 3.09E+00 |
| | | 92.56 | * | 5.41 | 3.73E+00 | | 2.15E+00 |
| | AM-241 | 59.54 | | 35.70 | -3.10E-02 | 2.84E-01 | 2.84E-01 |
| | CM-243 | 99.52 | | 14.40 | -3.08E-01 | 3.82E-01 | 6.42E-01 |
| | | 103.73 | | 23.00 | -2.14E-01 | | 3.82E-01 |
| | | 116.93 | | 8.32 | -1.80E-01 | | 1.17E+00 |
| | | 228.19 | | 10.56 | -4.85E-01 | | 1.34E+00 |
| | | 277.60 | | 14.00 | -1.39E-01 | | 1.13E+00 |
| | CM-245 | 99.52 | | 21.10 | -2.11E-01 | 2.62E-01 | 4.38E-01 |
| | | 103.73 | | 33.60 | -1.46E-01 | | 2.62E-01 |
| | | 116.93 | | 12.20 | -1.23E-01 | | 8.00E-01 |
| | | 174.94 | | 9.50 | -1.14E-01 | | 1.28E+00 |

Analysis Report for RCF19375

J16J23 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved:

EDWARD S. WALLACE (print/sign/date)

APR 03 2008

**Radiological Counting Facility**

Analysis Report for RCF19376

J16J33 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19376 |
| Sample Description | : J16J33 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.900E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:15:00AM |
| Acquisition Started | : 4/2/2008 12:41:25PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3641.9 seconds |
| Dead Time | : 1.15 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18369 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 1.000 | 1.49E+01 | 2.69E+00 | |
| PB-212 | | 0.707 | 8.50E-01 | 1.63E-01 | |
| RA-226d | | 0.718 | 4.70E-01 | 1.37E-01 | |
| TH-232d | | 0.823 | 5.19E-01 | 1.58E-01 | |
| U-238d | @ | 0.999 | 2.82E+00 | 1.40E+00 | |

Analysis Report for RCF19376

J16J33 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 1:42:10PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|
| m | 4 | 90.03 NP | 7.94E-03 | 34.63 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.49E+01 | 2.18E+00 | 2.18E+00 |
| | CO-60 | 1173.24 | | 99.90 | 9.00E-02 | 2.45E-01 | 2.45E-01 |
| | | 1332.50 | | 99.98 | 1.93E-02 | | 2.49E-01 |
| | NB-94 | 702.63 | | 99.81 | -3.33E-02 | 1.65E-01 | 1.65E-01 |
| | | 871.10 | | 99.89 | 3.19E-02 | | 1.79E-01 |
| | AG-108m | 433.94 | | 90.50 | 6.45E-02 | 1.34E-01 | 1.34E-01 |
| | | 614.28 | | 89.80 | -7.17E-03 | | 2.28E-01 |
| | | 722.94 | | 90.80 | 4.39E-03 | | 1.87E-01 |
| | CS-137 | 661.66 | | 85.21 | -3.24E-02 | 1.72E-01 | 1.72E-01 |
| | EU-152 | 40.12 | | 38.40 | 5.14E-03 | 2.18E-01 | 2.18E-01 |
| | | 45.38 | | 11.10 | 3.09E-01 | | 7.83E-01 |
| | | 121.78 | | 28.40 | 2.52E-02 | | 2.81E-01 |
| | | 244.69 | | 7.51 | -1.98E+00 | | 1.53E+00 |
| | | 344.29 | | 26.60 | -4.50E-01 | | 4.81E-01 |
| | | 411.12 | | 2.23 | 2.32E+00 | | 5.70E+00 |
| | | 443.89 | | 2.80 | -1.19E+00 | | 4.54E+00 |
| | | 778.92 | | 12.98 | 3.61E-01 | | 1.24E+00 |
| | | 867.38 | | 4.21 | 3.98E+00 | | 4.79E+00 |
| | | 964.11 | | 14.50 | -1.04E+00 | | 1.88E+00 |

Analysis Report for RCF19376

J16J33 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 1085.89 | | 9.94 | 8.19E-02 | | 2.18E+00 |
| | | 1089.71 | | 1.71 | 1.19E+01 | | 1.27E+01 |
| | | 1112.07 | | 13.60 | -1.49E+00 | | 1.57E+00 |
| | | 1212.93 | | 1.40 | 1.08E+01 | | 2.02E+01 |
| | | 1299.16 | | 1.63 | -1.53E+01 | | 1.31E+01 |
| | | 1408.00 | | 20.80 | 3.37E-01 | | 1.08E+00 |
| | EU-154 | 123.10 | | 40.50 | -6.51E-02 | 1.95E-01 | 1.95E-01 |
| | | 723.36 | | 19.70 | 1.74E-01 | | 8.69E-01 |
| | | 873.23 | | 11.45 | -4.84E-01 | | 1.55E+00 |
| | | 1004.78 | | 17.90 | 2.37E-01 | | 1.30E+00 |
| | | 1274.54 | | 35.50 | -2.72E-01 | | 6.23E-01 |
| | EU-155 | 86.54 | | 34.00 | 4.81E-02 | 3.04E-01 | 3.04E-01 |
| | | 105.31 | | 20.60 | -3.36E-01 | | 3.76E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 8.74E-01 | 3.14E-01 | 5.64E-01 |
| | | 77.11 | * | 17.70 | 8.37E-01 | | 3.14E-01 |
| | | 87.19 | | 6.27 | 3.26E-01 | | 1.63E+00 |
| + | RA-226d | 186.11 | | 3.28 | 2.45E+00 | 2.30E-01 | 3.29E+00 |
| | | 241.92 | | 7.46 | -8.74E-01 | | 2.19E+00 |
| | | 295.09 | * | 19.20 | 4.45E-01 | | 4.15E-01 |
| | | 351.87 | * | 37.10 | 5.44E-01 | | 2:30E-01 |
| | | 609.31 | * | 46.10 | 3.95E-01 | | 2.79E-01 |
| | | 1120.27 | | 15.00 | 1.11E+00 | | 1.76E+00 |
| | | 1764.49 | * | 15.90 | 8.85E-01 | | 8.11E-01 |
| + | TH-232d | 238.58 | * | 43.60 | 5.29E-01 | 2.43E-01 | 2.43E-01 |
| | | 338.42 | | 12.40 | 9.06E-02 | | 1.05E+00 |
| | | 583.02 | * | 30.87 | 5.53E-01 | | 3.28E-01 |
| | | 911.16 | * | 29.00 | 4.44E-01 | | 5.18E-01 |
| | | 968.97 | * | 17.40 | 5.03E-01 | | 9.85E-01 |
| | U-235 | 143.79 | | 10.50 | -1.70E-01 | 2.03E-01 | 8.01E-01 |
| | | 163.38 | | 4.70 | 1.57E+00 | | 2.00E+00 |
| | | 185.74 | | 53.00 | 1.51E-01 | | 2.03E-01 |
| | | 205.33 | | 4.70 | 1.56E-02 | | 2.19E+00 |
| + | U-238d | 63.29 | * | 3.80 | 2.82E+00 | 1.10E+00 | 2.16E+00 |
| | | 92.56 | * | 5.41 | 2.46E+00 | | 1.10E+00 |
| | AM-241 | 59.54 | | 35.70 | 5.93E-02 | 2.95E-01 | 2.95E-01 |
| | CM-243 | 99.52 | | 14.40 | 1.45E-01 | 3.39E-01 | 5.87E-01 |
| | | 103.73 | | 23.00 | -2.89E-01 | | 3.39E-01 |
| | | 116.93 | | 8.32 | 3.02E-02 | | 1.00E+00 |
| | | 228.19 | | 10.56 | 3.82E-01 | | 9.25E-01 |
| | | 277.60 | | 14.00 | 3.04E-01 | | 8.07E-01 |
| | CM-245 | 99.52 | | 21.10 | 9.87E-02 | 2.32E-01 | 4.01E-01 |
| | | 103.73 | | 33.60 | -1.98E-01 | | 2.32E-01 |
| | | 116.93 | | 12.20 | 2.06E-02 | | 6.84E-01 |
| | | 174.94 | | 9.50 | -3.25E-01 | | 9.89E-01 |

Analysis Report for RCF19376

J16J33 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved:

EDWARD S. WALLACE

(print/sign/date)

APR 03 2008

**Radiological Counting Facility**

Analysis Report for RCF19377

J16J34 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19377 |
| Sample Description | : J16J34 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 7.900E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:20:00AM |
| Acquisition Started | : 4/2/2008 1:57:01PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3640.0 seconds |
| Dead Time | : 1.10 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18374 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.999 | 1.55E+01 | 2.54E+00 | |
| PB-212 | | 0.707 | 8.60E-01 | 1.55E-01 | |
| RA-226d | | 0.675 | 4.11E-01 | 1.36E-01 | |
| TH-232d | | 0.854 | 5.37E-01 | 1.57E-01 | |
| U-235 | | 0.546 | 3.52E-01 | 1.27E-01 | |
| U-238d | @ | 1.000 | 9.01E+00 | 1.51E+00 | |

Analysis Report for RCF19377

J16J34 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 2:57:45PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
NP = No Peak
UK = Unknown
Errors quoted at 2.000 sigma

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.55E+01 | 1.85E+00 | 1.85E+00 |
| | CO-60 | 1173.24 | | 99.90 | 2.07E-02 | 1.98E-01 | 2.21E-01 |
| | | 1332.50 | | 99.98 | -6.43E-02 | | 1.98E-01 |
| | NB-94 | 702.63 | | 99.81 | 7.74E-02 | 1.68E-01 | 1.68E-01 |
| | | 871.10 | | 99.89 | -5.62E-03 | | 1.82E-01 |
| | AG-108m | 433.94 | | 90.50 | 1.50E-02 | 1.29E-01 | 1.29E-01 |
| | | 614.28 | | 89.80 | -1.11E-01 | | 2.10E-01 |
| | | 722.94 | | 90.80 | 5.00E-02 | | 1.78E-01 |
| | CS-137 | 661.66 | | 85.21 | 6.50E-02 | 1.74E-01 | 1.74E-01 |
| | EU-152 | 40.12 | | 38.40 | -8.79E-02 | 2.00E-01 | 2.00E-01 |
| | | 45.38 | | 11.10 | 1.60E-01 | | 7.32E-01 |
| | | 121.78 | | 28.40 | -1.34E-01 | | 2.55E-01 |
| | | 244.69 | | 7.51 | -1.04E+00 | | 1.34E+00 |
| | | 344.29 | | 26.60 | -1.27E-01 | | 4.03E-01 |
| | | 411.12 | | 2.23 | 3.90E+00 | | 4.86E+00 |
| | | 443.89 | | 2.80 | 1.33E+00 | | 4.01E+00 |
| | | 778.92 | | 12.98 | 8.43E-02 | | 1.21E+00 |
| | | 867.38 | | 4.21 | -1.22E+00 | | 4.59E+00 |

Analysis Report for RCF19377

J16J34 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 1.39E+00 | | 1.54E+00 |
| | | 1085.89 | | 9.94 | 2.82E-01 | | 1.90E+00 |
| | | 1089.71 | | 1.71 | -2.26E+00 | | 1.02E+01 |
| | | 1112.07 | | 13.60 | -2.55E+00 | | 1.37E+00 |
| | | 1212.93 | | 1.40 | -1.83E+00 | | 1.50E+01 |
| | | 1299.16 | | 1.63 | 3.47E+00 | | 1.28E+01 |
| | | 1408.00 | | 20.80 | -6.36E-02 | | 9.07E-01 |
| | EU-154 | 123.10 | | 40.50 | 6.79E-03 | 1.83E-01 | 1.83E-01 |
| | | 723.36 | | 19.70 | 4.16E-01 | | 8.40E-01 |
| | | 873.23 | | 11.45 | 6.02E-01 | | 1.59E+00 |
| | | 1004.78 | | 17.90 | 9.09E-01 | | 1.10E+00 |
| | | 1274.54 | | 35.50 | 3.77E-01 | | 7.41E-01 |
| | EU-155 | 86.54 | | 34.00 | -2.93E-01 | 2.89E-01 | 2.89E-01 |
| | | 105.31 | | 20.60 | -1.75E-01 | | 3.52E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.14E+00 | 3.42E-01 | 6.13E-01 |
| | | 77.11 | * | 17.70 | 7.62E-01 | | 3.42E-01 |
| | | 87.19 | | 6.27 | -9.17E-01 | | 1.62E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 6.10E+00 | 2.17E-01 | 1.94E+00 |
| | | 241.92 | | 7.46 | -7.90E-02 | | 1.89E+00 |
| | | 295.09 | * | 19.20 | 4.34E-01 | | 4.51E-01 |
| | | 351.87 | * | 37.10 | 5.22E-01 | | 2.17E-01 |
| | | 609.31 | * | 46.10 | 3.35E-01 | | 2.80E-01 |
| | | 1120.27 | | 15.00 | 3.58E-01 | | 1.38E+00 |
| | | 1764.49 | | 15.90 | 6.73E-01 | | 1.38E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 6.88E-01 | 2.13E-01 | 2.13E-01 |
| | | 338.42 | * | 12.40 | 4.71E-01 | | 6.08E-01 |
| | | 583.02 | * | 30.87 | 4.15E-01 | | 3.84E-01 |
| | | 911.16 | * | 29.00 | 6.22E-01 | | 4.07E-01 |
| | | 968.97 | | 17.40 | 4.54E-01 | | 1.27E+00 |
| + | U-235 | 143.79 | | 10.50 | 7.77E-02 | 1.20E-01 | 7.89E-01 |
| | | 163.38 | | 4.70 | -1.50E-02 | | 1.83E+00 |
| | | 185.74 | * | 53.00 | 3.77E-01 | | 1.20E-01 |
| | | 205.33 | | 4.70 | 1.65E+00 | | 2.01E+00 |
| + | U-238d | 63.29 | * | 3.80 | 9.01E+00 | 1.45E+00 | 1.81E+00 |
| | | 92.56 | * | 5.41 | 1.03E+01 | | 1.45E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.57E+00 | 3.39E-01 | 3.39E-01 |
| | CM-243 | 99.52 | | 14.40 | -2.41E-01 | 3.11E-01 | 5.41E-01 |
| | | 103.73 | | 23.00 | -5.03E-01 | | 3.11E-01 |
| | | 116.93 | | 8.32 | 7.60E-02 | | 9.43E-01 |
| | | 228.19 | | 10.56 | -1.38E-01 | | 8.35E-01 |
| | | 277.60 | | 14.00 | -4.37E-01 | | 7.29E-01 |
| | CM-245 | 99.52 | | 21.10 | -1.65E-01 | 2.13E-01 | 3.69E-01 |
| | | 103.73 | | 33.60 | -3.45E-01 | | 2.13E-01 |
| | | 116.93 | | 12.20 | 5.18E-02 | | 6.43E-01 |
| | | 174.94 | | 9.50 | -6.23E-01 | | 8.34E-01 |

Analysis Report for RCF19377

J16J34 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 03 2008 Edward S Wallace
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19378

J16J35 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19378 |
| Sample Description | : J16J35 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 7.000E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:25:00AM |
| Acquisition Started | : 4/2/2008 1:57:08PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/5/2008 |
| Efficiency Calibration Description | : 80g Pill box 2/5/2008 |
| Sample Number | : 18375 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.983 | 1.07E+01 | 3.22E+00 | |
| RA-226d | | 0.675 | 2.55E-01 | 1.28E-01 | |
| U-235 | | 0.550 | 4.17E-01 | 1.68E-01 | |
| U-238d | @ | 1.000 | 6.54E+00 | 1.81E+00 | |

Analysis Report for RCF19378

J16J35 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 2:57:15PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|
| 2 | 77.19 Pb-212 | 1.62E-02 | 51.90 |
| 5 | 238.61 Pb-212 | 3.04E-02 | 18.29 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.07E+01 | 2.17E+00 | 2.17E+00 |
| | CO-60 | 1173.24 | | 99.90 | 1.09E-03 | 1.62E-01 | 2.18E-01 |
| | | 1332.50 | | 99.98 | -5.65E-02 | | 1.62E-01 |
| | NB-94 | 702.63 | | 99.81 | -2.86E-02 | 1.63E-01 | 1.63E-01 |
| | | 871.10 | | 99.89 | -7.19E-02 | | 1.72E-01 |
| | AG-108m | 433.94 | | 90.50 | 2.85E-02 | 1.23E-01 | 1.23E-01 |
| | | 614.28 | | 89.80 | 5.60E-02 | | 1.90E-01 |
| | | 722.94 | | 90.80 | 3.86E-02 | | 1.68E-01 |
| | CS-137 | 661.66 | | 85.21 | 2.95E-02 | 1.76E-01 | 1.76E-01 |
| | EU-152 | 40.12 | | 38.40 | -2.33E-02 | 2.40E-01 | 2.48E-01 |
| | | 45.38 | | 11.10 | 4.33E-01 | | 8.17E-01 |
| | | 121.78 | | 28.40 | 2.52E-02 | | 2.40E-01 |
| | | 244.69 | | 7.51 | 4.69E-01 | | 1.27E+00 |
| | | 344.29 | | 26.60 | -2.27E-01 | | 3.44E-01 |
| | | 411.12 | | 2.23 | -6.69E-01 | | 4.73E+00 |
| | | 443.89 | | 2.80 | 1.40E+00 | | 3.82E+00 |
| | | 778.92 | | 12.98 | -2.54E-01 | | 1.10E+00 |
| | | 867.38 | | 4.21 | -1.05E+00 | | 4.10E+00 |

Analysis Report for RCF19378

J16J35 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 6.35E-01 | | 1.54E+00 |
| | | 1085.89 | | 9.94 | -6.91E-01 | | 1.58E+00 |
| | | 1089.71 | | 1.71 | -5.63E+00 | | 9.04E+00 |
| | | 1112.07 | | 13.60 | -1.09E+00 | | 1.62E+00 |
| | | 1212.93 | | 1.40 | 7.04E+00 | | 1.70E+01 |
| | | 1299.16 | | 1.63 | 1.53E+00 | | 1.15E+01 |
| | | 1408.00 | | 20.80 | 2.34E-02 | | 8.79E-01 |
| | EU-154 | 123.10 | | 40.50 | 5.04E-02 | 1.72E-01 | 1.72E-01 |
| | | 723.36 | | 19.70 | 1.78E-01 | | 7.73E-01 |
| | | 873.23 | | 11.45 | -1.83E-01 | | 1.55E+00 |
| | | 1004.78 | | 17.90 | 4.42E-01 | | 1.10E+00 |
| | | 1274.54 | | 35.50 | 1.98E-01 | | 6.08E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.75E-01 | 2.62E-01 | 2.62E-01 |
| | | 105.31 | | 20.60 | -5.42E-02 | | 3.24E-01 |
| | PB-212 | 74.81 | | 10.50 | -1.08E-01 | 6.06E-01 | 8.36E-01 |
| | | 77.11 | | 17.70 | 1.17E+00 | | 6.06E-01 |
| | | 87.19 | | 6.27 | 4.05E-01 | | 1.45E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 6.99E+00 | 2.90E-01 | 2.72E+00 |
| | | 241.92 | | 7.46 | -2.62E-01 | | 1.80E+00 |
| | | 295.09 | * | 19.20 | 2.96E-01 | | 4.36E-01 |
| | | 351.87 | * | 37.10 | 3.20E-01 | | 2.90E-01 |
| | | 609.31 | * | 46.10 | 1.81E-01 | | 3.12E-01 |
| | | 1120.27 | | 15.00 | 1.14E+00 | | 1.64E+00 |
| | | 1764.49 | | 15.90 | 4.01E-01 | | 1.21E+00 |
| | TH-232d | 238.58 | | 43.60 | 4.22E-01 | 3.08E-01 | 3.08E-01 |
| | | 338.42 | | 12.40 | 2.38E-02 | | 8.31E-01 |
| | | 583.02 | | 30.87 | 5.48E-01 | | 5.45E-01 |
| | | 911.16 | | 29.00 | 2.67E-01 | | 7.38E-01 |
| | | 968.97 | | 17.40 | 5.21E-01 | | 1.28E+00 |
| + | U-235 | 143.79 | | 10.50 | 5.60E-01 | 1.68E-01 | 7.41E-01 |
| | | 163.38 | | 4.70 | 8.92E-01 | | 1.55E+00 |
| | | 185.74 | * | 53.00 | 4.33E-01 | | 1.68E-01 |
| | | 205.33 | | 4.70 | -8.93E-01 | | 1.57E+00 |
| + | U-238d | 63.29 | * | 3.80 | 6.54E+00 | 1.76E+00 | 2.49E+00 |
| | | 92.56 | * | 5.41 | 5.06E+00 | | 1.76E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.95E-02 | 2.05E-01 | 2.05E-01 |
| | CM-243 | 99.52 | | 14.40 | 1.14E-01 | 2.91E-01 | 5.02E-01 |
| | | 103.73 | | 23.00 | -8.24E-02 | | 2.91E-01 |
| | | 116.93 | | 8.32 | 7.48E-02 | | 8.32E-01 |
| | | 228.19 | | 10.56 | 6.63E-01 | | 8.27E-01 |
| | | 277.60 | | 14.00 | 3.60E-01 | | 6.30E-01 |
| | CM-245 | 99.52 | | 21.10 | 7.75E-02 | 1.99E-01 | 3.43E-01 |
| | | 103.73 | | 33.60 | -5.64E-02 | | 1.99E-01 |
| | | 116.93 | | 12.20 | 5.10E-02 | | 5.68E-01 |
| | | 174.94 | | 9.50 | -5.53E-01 | | 6.74E-01 |

Analysis Report for RCF19378

J16J35 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
• = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 03 2008 Edward S Wallace
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19379

J16J36 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19379 |
| Sample Description | : J16J36 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.600E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:30:00AM |
| Acquisition Started | : 4/2/2008 2:59:17PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3640.8 seconds |
| Dead Time | : 1.12 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18379 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.997 | 1.20E+01 | 2.50E+00 | |
| PB-212 | | 0.706 | 8.85E-01 | 2.00E-01 | |
| RA-226d | | 0.676 | 2.38E-01 | 1.34E-01 | |
| TH-232d | | 0.855 | 4.09E-01 | 1.57E-01 | |
| U-235 | | 1.000 | 1.59E+00 | 3.08E-01 | |
| U-238d | @ | 1.000 | 3.15E+01 | 3.24E+00 | |

Analysis Report for RCF19379

J16J36 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 4:00:01PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|---|
| | 4 | 84.02 | Th-231 | 1.84E-02 | 51.16 |
| m | 6 | 98.41 | No Peak | 2.53E-02 | 14.28 |
| | 7 | 112.99 | No Peak | 2.57E-02 | 32.17 |
| | 19 | 1001.16 | Pa-234m | 1.14E-02 | 23.70 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.20E+01 | 2.23E+00 | 2.23E+00 |
| | CO-60 | 1173.24 | | 99.90 | -2.14E-02 | 2.06E-01 | 2.70E-01 |
| | | 1332.50 | | 99.98 | 6.27E-02 | | 2.06E-01 |
| | NB-94 | 702.63 | | 99.81 | -1.27E-01 | 1.79E-01 | 1.83E-01 |
| | | 871.10 | | 99.89 | -1.39E-02 | | 1.79E-01 |
| | AG-108m | 433.94 | | 90.50 | 1.55E-02 | 1.61E-01 | 1.61E-01 |
| | | 614.28 | | 89.80 | -6.94E-03 | | 2.43E-01 |
| | | 722.94 | | 90.80 | 5.34E-04 | | 1.99E-01 |
| | CS-137 | 661.66 | | 85.21 | -6.24E-02 | 1.95E-01 | 1.95E-01 |
| | EU-152 | 40.12 | | 38.40 | -5.84E-02 | 2.82E-01 | 2.82E-01 |
| | | 45.38 | | 11.10 | 8.56E-03 | | 1.07E+00 |
| | | 121.78 | | 28.40 | 1.35E-01 | | 3.54E-01 |
| | | 244.69 | | 7.51 | -1.53E+00 | | 1.51E+00 |
| | | 344.29 | | 26.60 | -6.58E-02 | | 5.08E-01 |
| | | 411.12 | | 2.23 | -1.60E+00 | | 6.22E+00 |

Analysis Report for RCF19379

J16J36 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 443.89 | | 2.80 | 3.07E+00 | | 4.91E+00 |
| | | 778.92 | | 12.98 | -7.40E-01 | | 1.67E+00 |
| | | 867.38 | | 4.21 | 1.47E-01 | | 4.63E+00 |
| | | 964.11 | | 14.50 | 1.48E-01 | | 1.68E+00 |
| | | 1085.89 | | 9.94 | 2.71E-01 | | 2.28E+00 |
| | | 1089.71 | | 1.71 | -1.92E+00 | | 1.44E+01 |
| | | 1112.07 | | 13.60 | -2.06E+00 | | 1.57E+00 |
| | | 1212.93 | | 1.40 | 1.66E+00 | | 1.89E+01 |
| | | 1299.16 | | 1.63 | -1.23E+00 | | 1.32E+01 |
| | | 1408.00 | | 20.80 | -5.33E-01 | | 8.80E-01 |
| | EU-154 | 123.10 | | 40.50 | 5.31E-02 | 2.48E-01 | 2.48E-01 |
| | | 723.36 | | 19.70 | -3.66E-01 | | 8.93E-01 |
| | | 873.23 | | 11.45 | -8.54E-01 | | 1.58E+00 |
| | | 1004.78 | | 17.90 | 2.22E+00 | | 1.81E+00 |
| | | 1274.54 | | 35.50 | 1.90E-01 | | 6.94E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.61E-01 | 4.50E-01 | 4.50E-01 |
| | | 105.31 | | 20.60 | -5.83E-02 | | 5.39E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 9.54E-01 | 5.15E-01 | 9.05E-01 |
| | | 77.11 | * | 17.70 | 8.56E-01 | | 5.15E-01 |
| | | 87.19 | | 6.27 | -8.72E-01 | | 2.56E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 2.77E+01 | 3.34E-01 | 3.53E+00 |
| | | 241.92 | | 7.46 | 3.49E-01 | | 2.13E+00 |
| | | 295.09 | * | 19.20 | 2.15E-01 | | 4.24E-01 |
| | | 351.87 | * | 37.10 | 2.17E-01 | | 3.38E-01 |
| | | 609.31 | * | 46.10 | 2.70E-01 | | 3.34E-01 |
| | | 1120.27 | | 15.00 | -3.96E-01 | | 1.53E+00 |
| | | 1764.49 | | 15.90 | 5.63E-01 | | 1.42E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 4.46E-01 | 2.76E-01 | 2.76E-01 |
| | | 338.42 | * | 12.40 | 7.65E-01 | | 7.67E-01 |
| | | 583.02 | * | 30.87 | 3.66E-01 | | 4.08E-01 |
| | | 911.16 | * | 29.00 | 3.00E-01 | | 5.26E-01 |
| | | 968.97 | | 17.40 | 8.66E-01 | | 1.45E+00 |
| + | U-235 | 143.79 | * | 10.50 | 1.29E+00 | 2.19E-01 | 6.92E-01 |
| | | 163.38 | * | 4.70 | 2.19E+00 | | 1.84E+00 |
| | | 185.74 | * | 53.00 | 1.72E+00 | | 2.19E-01 |
| | | 205.33 | * | 4.70 | 2.50E+00 | | 2.14E+00 |
| + | U-238d | 63.29 | * | 3.80 | 3.15E+01 | 1.49E+00 | 3.14E+00 |
| | | 92.56 | * | 5.41 | 2.73E+01 | | 1.49E+00 |
| | AM-241 | 59.54 | | 35.70 | -6.48E-02 | 5.57E-01 | 5.57E-01 |
| | CM-243 | 99.52 | | 14.40 | -3.52E-01 | 4.77E-01 | 8.21E-01 |
| | | 103.73 | | 23.00 | -2.23E-02 | | 4.77E-01 |
| | | 116.93 | | 8.32 | 1.89E-02 | | 1.33E+00 |
| | | 228.19 | | 10.56 | 4.74E-01 | | 1.06E+00 |
| | | 277.60 | | 14.00 | 4.08E-01 | | 8.90E-01 |
| | CM-245 | 99.52 | | 21.10 | -2.41E-01 | 3.26E-01 | 5.60E-01 |
| | | 103.73 | | 33.60 | -1.53E-02 | | 3.26E-01 |
| | | 116.93 | | 12.20 | 1.29E-02 | | 9.07E-01 |
| | | 174.94 | | 9.50 | -6.38E-01 | | 1.12E+00 |

Analysis Report for RCF19379

J16J36 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 03 2008 (print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19380

J16J37 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19380 |
| Sample Description | : J16J37 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.200E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:35:00AM |
| Acquisition Started | : 4/2/2008 4:07:28PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3642.2 seconds |
| Dead Time | : 1.16 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18384 |

# INTERFERENCE CORRECTED REPORT

| *Nuclide Name* | | *Nuclide Id Confidence* | *Wt mean Activity (pCi/grams)* | *Wt mean Activity Uncertainty* | *Comments* |
|---|---|---|---|---|---|
| K-40 | | 0.997 | 1.46E+01 | 2.81E+00 | |
| CS-137 | | 0.999 | 1.85E-01 | 1.22E-01 | |
| PB-212 | | 0.707 | 1.10E+00 | 2.57E-01 | |
| RA-226d | | 0.407 | 5.25E-01 | 1.91E-01 | |
| TH-232d | | 0.853 | 5.07E-01 | 1.80E-01 | |
| U-235 | | 1.000 | 2.93E+00 | 4.70E-01 | |
| U-238d | @ | 1.000 | 7.07E+01 | 5.81E+00 | |

Analysis Report for RCF19380

J16J37 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 5:08:13PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|
| M | 4 | 84.21 No Peak | 4.13E-02 | 14.67 |
| m | 5 | 89.78 No Peak | 3.66E-02 | 15.01 |
| m | 7 | 98.46 No Peak | 6.15E-02 | 9.21 |
| | 8 | 112.75 No Peak | 5.27E-02 | 20.69 |
| m | 13 | 209.02 No Peak | 1.02E-02 | 25.71 |
| | 20 | 766.70 No Peak | 9.32E-03 | 27.59 |
| | 22 | 1001.12 Pa-234m | 2.04E-02 | 15.06 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.46E+01 | 2.35E+00 | 2.35E+00 |
| | CO-60 | 1173.24 | | 99.90 | -1.47E-01 | 2.39E-01 | 2.60E-01 |
| | | 1332.50 | | 99.98 | 6.69E-02 | | 2.39E-01 |
| | NB-94 | 702.63 | | 99.81 | -8.70E-03 | 2.13E-01 | 2.13E-01 |
| | | 871.10 | | 99.89 | 7.05E-02 | | 2.26E-01 |
| | AG-108m | 433.94 | | 90.50 | 9.33E-02 | 1.88E-01 | 1.88E-01 |
| | | 614.28 | | 89.80 | -7.96E-02 | | 2.90E-01 |
| | | 722.94 | | 90.80 | -1.23E-02 | | 2.55E-01 |
| + | CS-137 | 661.66 | * | 85.21 | 1.85E-01 | 1.86E-01 | 1.86E-01 |
| | EU-152 | 40.12 | | 38.40 | 8.01E-02 | 3.79E-01 | 3.79E-01 |
| | | 45.38 | | 11.10 | -1.12E+00 | | 1.41E+00 |
| | | 121.78 | | 28.40 | 1.28E-01 | | 4.50E-01 |

Analysis Report for RCF19380

J16J37 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 244.69 | | 7.51 | -2.50E-01 | | 1.82E+00 |
| | | 344.29 | | 26.60 | 3.01E-01 | | 6.07E-01 |
| | | 411.12 | | 2.23 | -3.92E-01 | | 6.79E+00 |
| | | 443.89 | | 2.80 | 3.76E+00 | | 6.09E+00 |
| | | 778.92 | | 12.98 | -1.50E+00 | | 1.60E+00 |
| | | 867.38 | | 4.21 | 2.30E+00 | | 5.34E+00 |
| | | 964.11 | | 14.50 | -7.51E-01 | | 1.93E+00 |
| | | 1085.89 | | 9.94 | 3.35E-01 | | 2.65E+00 |
| | | 1089.71 | | 1.71 | 9.21E+00 | | 1.63E+01 |
| | | 1112.07 | | 13.60 | -2.05E-01 | | 1.90E+00 |
| | | 1212.93 | | 1.40 | 1.03E+01 | | 1.96E+01 |
| | | 1299.16 | | 1.63 | 9.30E+00 | | 1.73E+01 |
| | | 1408.00 | | 20.80 | 2.47E-01 | | 1.05E+00 |
| | EU-154 | 123.10 | | 40.50 | 1.19E-02 | 3.17E-01 | 3.17E-01 |
| | | 723.36 | | 19.70 | 1.22E-01 | | 1.18E+00 |
| | | 873.23 | | 11.45 | -6.38E-01 | | 1.96E+00 |
| | | 1004.78 | | 17.90 | 2.26E+00 | | 2.10E+00 |
| | | 1274.54 | | 35.50 | -6.86E-01 | | 6.94E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.18E+01 | 6.19E-01 | 6.19E-01 |
| | | 105.31 | | 20.60 | -2.79E-01 | | 6.72E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.35E+00 | 7.25E-01 | 1.16E+00 |
| | | 77.11 | * | 17.70 | 1.00E+00 | | 7.25E-01 |
| | | 87.19 | | 6.27 | -1.48E+02 | | 3.57E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 4.74E+01 | 3.48E-01 | 4.48E+00 |
| | | 241.92 | | 7.46 | 1.35E+00 | | 2.45E+00 |
| | | 295.09 | | 19.20 | -8.40E-01 | | 7.83E-01 |
| | | 351.87 | * | 37.10 | 5.65E-01 | | 3.48E-01 |
| | | 609.31 | * | 46.10 | 4.98E-01 | | 3.57E-01 |
| | | 1120.27 | | 15.00 | 6.95E-01 | | 1.96E+00 |
| | | 1764.49 | | 15.90 | 5.84E-01 | | 1.80E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 4.20E-01 | 3.21E-01 | 3.21E-01 |
| | | 338.42 | * | 12.40 | 5.76E-01 | | 9.08E-01 |
| | | 583.02 | * | 30.87 | 5.23E-01 | | 5.44E-01 |
| | | 911.16 | * | 29.00 | 6.32E-01 | | 5.57E-01 |
| | | 968.97 | | 17.40 | 1.86E+00 | | 1.70E+00 |
| + | U-235 | 143.79 | * | 10.50 | 2.95E+00 | 2.77E-01 | 1.12E+00 |
| | | 163.38 | * | 4.70 | 2.95E+00 | | 2.20E+00 |
| | | 185.74 | * | 53.00 | 2.93E+00 | | 2.77E-01 |
| | | 205.33 | * | 4.70 | 2.95E+00 | | 1.72E+00 |
| + | U-238d | 63.29 | * | 3.80 | 7.07E+01 | 2.05E+00 | 4.89E+00 |
| | | 92.56 | * | 5.41 | 6.77E+01 | | 2.05E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.78E-01 | 8.32E-01 | 8.32E-01 |
| | CM-243 | 99.52 | | 14.40 | 7.26E-02 | 6.04E-01 | 1.18E+00 |
| | | 103.73 | | 23.00 | -4.63E-01 | | 6.04E-01 |
| | | 116.93 | | 8.32 | -7.44E-01 | | 1.74E+00 |
| | | 228.19 | | 10.56 | -3.04E-01 | | 1.22E+00 |
| | | 277.60 | | 14.00 | -3.60E-01 | | 9.73E-01 |
| | CM-245 | 99.52 | | 21.10 | 4.96E-02 | 4.13E-01 | 8.05E-01 |

Analysis Report for RCF19380

J16J37 FF2/618-7 Burial Ground Stockpile Soil Sample

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|
| | 103.73 | 33.60 | -3.17E-01 | | 4.13E-01 |
| | 116.93 | 12.20 | -5.07E-01 | | 1.19E+00 |
| | 174.94 | 9.50 | -4.38E-01 | | 1.39E+00 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 03 2008 Edward S Wallace
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19381

J16J38 FF2/618-7 Burial Ground Stockpile Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19381 |
| Sample Description | : J16J38 FF2/618-7 Burial Ground Stockpile Soil Sample |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.200E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/2/2008 7:40:00AM |
| Acquisition Started | : 4/2/2008 4:07:35PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/5/2008 |
| Efficiency Calibration Description | : 80g Pill box 2/5/2008 |
| Sample Number | : 18385 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.995 | 1.38E+01 | 4.02E+00 | |
| PB-212 | | 0.707 | 8.60E-01 | 1.71E-01 | |
| TH-232d | | 0.433 | 6.57E-01 | 2.21E-01 | |
| U-235 | | 0.551 | 3.21E-01 | 1.40E-01 | |
| U-238d | @ | 1.000 | 5.66E+00 | 1.87E+00 | |

Analysis Report for RCF19381

J16J38 FF2/618-7 Burial Ground Stockpile Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/2/2008 5:07:43PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|
| 7 | 295.14 | Pb-214 | 7.09E-03 | 60.61 |
| 8 | 352.08 | Pb-214 | 5.93E-03 | 64.45 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.38E+01 | 2.63E+00 | 2.63E+00 |
| | CO-60 | 1173.24 | | 99.90 | -1.47E-01 | 2.12E-01 | 2.27E-01 |
| | | 1332.50 | | 99.98 | -3.43E-02 | | 2.12E-01 |
| | NB-94 | 702.63 | | 99.81 | -5.57E-02 | 1.55E-01 | 1.55E-01 |
| | | 871.10 | | 99.89 | -1.82E-02 | | 1.89E-01 |
| | AG-108m | 433.94 | | 90.50 | -8.25E-02 | 1.38E-01 | 1.38E-01 |
| | | 614.28 | | 89.80 | -7.03E-03 | | 2.13E-01 |
| | | 722.94 | | 90.80 | 2.00E-02 | | 1.84E-01 |
| | CS-137 | 661.66 | | 85.21 | -2.08E-02 | 2.16E-01 | 2.16E-01 |
| | EU-152 | 40.12 | | 38.40 | 4.26E-03 | 2.55E-01 | 2.67E-01 |
| | | 45.38 | | 11.10 | 3.33E-01 | | 9.00E-01 |
| | | 121.78 | | 28.40 | -1.57E-01 | | 2.55E-01 |
| | | 244.69 | | 7.51 | 8.26E-01 | | 1.23E+00 |
| | | 344.29 | | 26.60 | -5.09E-01 | | 4.23E-01 |
| | | 411.12 | | 2.23 | 7.62E-01 | | 5.03E+00 |
| | | 443.89 | | 2.80 | -1.80E+00 | | 4.28E+00 |
| | | 778.92 | | 12.98 | 5.52E-01 | | 1.28E+00 |
| | | 867.38 | | 4.21 | -3.53E+00 | | 4.48E+00 |

Analysis Report for RCF19381

J16J38 FF2/618-7 Burial Ground Stockpile Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 1.00E+00 | | 1.80E+00 |
| | | 1085.89 | | 9.94 | 1.42E+00 | | 2.72E+00 |
| | | 1089.71 | | 1.71 | -6.56E+00 | | 1.43E+01 |
| | | 1112.07 | | 13.60 | -1.65E+00 | | 1.70E+00 |
| | | 1212.93 | | 1.40 | 1.40E+01 | | 2.13E+01 |
| | | 1299.16 | | 1.63 | -5.80E+00 | | 1.35E+01 |
| | | 1408.00 | | 20.80 | -4.30E-01 | | 9.42E-01 |
| | EU-154 | 123.10 | | 40.50 | 5.62E-02 | 1.89E-01 | 1.89E-01 |
| | | 723.36 | | 19.70 | 9.21E-02 | | 8.47E-01 |
| | | 873.23 | | 11.45 | 7.82E-01 | | 1.64E+00 |
| | | 1004.78 | | 17.90 | 8.59E-01 | | 1.31E+00 |
| | | 1274.54 | | 35.50 | -3.81E-01 | | 5.38E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.72E-02 | 2.92E-01 | 2.92E-01 |
| | | 105.31 | | 20.60 | 9.56E-02 | | 3.70E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 6.81E-01 | 4.03E-01 | 7.14E-01 |
| | | 77.11 | * | 17.70 | 9.64E-01 | | 4.03E-01 |
| | | 87.19 | | 6.27 | 9.46E-02 | | 1.65E+00 |
| | RA-226d | 186.11 | | 3.28 | 4.98E+00 | 3.97E-01 | 3.52E+00 |
| | | 241.92 | | 7.46 | 8.13E-01 | | 2.01E+00 |
| | | 295.09 | | 19.20 | 2.80E-01 | | 6.14E-01 |
| | | 351.87 | | 37.10 | 4.19E-01 | | 3.97E-01 |
| | | 609.31 | | 46.10 | 5.40E-01 | | 4.56E-01 |
| | | 1120.27 | | 15.00 | 1.00E+00 | | 1.87E+00 |
| | | 1764.49 | | 15.90 | 2.31E-01 | | 1.48E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 7.09E-01 | 2.47E-01 | 2.47E-01 |
| | | 338.42 | | 12.40 | 8.18E-01 | | 1.14E+00 |
| | | 583.02 | * | 30.87 | 5.77E-01 | | 5.19E-01 |
| | | 911.16 | | 29.00 | 8.51E-01 | | 8.46E-01 |
| | | 968.97 | | 17.40 | 1.08E+00 | | 1.54E+00 |
| + | U-235 | 143.79 | | 10.50 | 2.17E-01 | 1.56E-01 | 7.70E-01 |
| | | 163.38 | | 4.70 | 1.32E+00 | | 1.78E+00 |
| | | 185.74 | * | 53.00 | 3.21E-01 | | 1.56E-01 |
| | | 205.33 | | 4.70 | -1.57E-01 | | 1.91E+00 |
| + | U-238d | 63.29 | * | 3.80 | 5.66E+00 | 1.94E+00 | 2.68E+00 |
| | | 92.56 | * | 5.41 | 5.75E+00 | | 1.94E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.00E-02 | 2.19E-01 | 2.19E-01 |
| | CM-243 | 99.52 | | 14.40 | 1.02E-01 | 3.34E-01 | 5.47E-01 |
| | | 103.73 | | 23.00 | 6.61E-02 | | 3.34E-01 |
| | | 116.93 | | 8.32 | -7.61E-01 | | 8.49E-01 |
| | | 228.19 | | 10.56 | -2.43E-01 | | 8.73E-01 |
| | | 277.60 | | 14.00 | 2.80E-01 | | 7.21E-01 |
| | CM-245 | 99.52 | | 21.10 | 6.98E-02 | 2.28E-01 | 3.73E-01 |
| | | 103.73 | | 33.60 | 4.53E-02 | | 2.28E-01 |
| | | 116.93 | | 12.20 | -5.19E-01 | | 5.79E-01 |
| | | 174.94 | | 9.50 | -4.16E-01 | | 7.92E-01 |

Analysis Report for RCF19381

J16J38 FF2/618-7 Burial Ground Stockpile Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 03 2008 Edward S Wallace
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19405

J16J39 SAF-RC-087 FF2 618-7BG&STOCK PILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19405 |
| Sample Description | : J16J39 SAF-RC-087 FF2 618-7BG&STOCK PILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.300E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/3/2008 7:15:00PM |
| Acquisition Started | : 4/3/2008 2:41:11PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3641.3 seconds |
| Dead Time | : 1.13 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18435 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.997 | 1.35E+01 | 2.69E+00 | |
| PB-212 | | 0.707 | 8.35E-01 | 1.63E-01 | |
| RA-226d | | 0.676 | 3.89E-01 | 1.48E-01 | |
| TH-232d | | 0.852 | 6.03E-01 | 1.58E-01 | |
| U-235 | | 0.546 | 2.38E-01 | 1.42E-01 | |
| U-238d | @ | 1.000 | 4.18E+00 | 1.35E+00 | |

Analysis Report for RCF19405

J16J39 SAF-RC-087 FF2 618-7BG&STOCK PILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/3/2008 3:41:55PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
NP = No Peak
UK = Unknown
Errors quoted at 2.000 sigma

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.35E+01 | 2.31E+00 | 2.31E+00 |
| | CO-60 | 1173.24 | | 99.90 | 1.08E-01 | 2.39E-01 | 2.49E-01 |
| | | 1332.50 | | 99.98 | -9.00E-02 | | 2.39E-01 |
| | NB-94 | 702.63 | | 99.81 | -2.37E-02 | 1.66E-01 | 1.66E-01 |
| | | 871.10 | | 99.89 | -6.59E-02 | | 2.28E-01 |
| | AG-108m | 433.94 | | 90.50 | 5.78E-02 | 1.56E-01 | 1.56E-01 |
| | | 614.28 | | 89.80 | -4.41E-02 | | 2.41E-01 |
| | | 722.94 | | 90.80 | 5.60E-02 | | 2.17E-01 |
| | CS-137 | 661.66 | | 85.21 | 6.60E-03 | 2.07E-01 | 2.07E-01 |
| | EU-152 | 40.12 | | 38.40 | 1.14E-01 | 2.35E-01 | 2.35E-01 |
| | | 45.38 | | 11.10 | -8.10E-02 | | 7.90E-01 |
| | | 121.78 | | 28.40 | 9.08E-02 | | 2.91E-01 |
| | | 244.69 | | 7.51 | -2.50E+00 | | 1.48E+00 |
| | | 344.29 | | 26.60 | 2.67E-02 | | 4.97E-01 |
| | | 411.12 | | 2.23 | -2.27E+00 | | 5.77E+00 |
| | | 443.89 | | 2.80 | -7.81E-01 | | 4.74E+00 |
| | | 778.92 | | 12.98 | -3.67E-01 | | 1.39E+00 |
| | | 867.38 | | 4.21 | 2.53E+00 | | 5.53E+00 |

Analysis Report for RCF19405

J16J39 SAF-RC-087 FF2 618-7BG&STOCK PILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 1.93E+00 | | 1.97E+00 |
| | | 1085.89 | | 9.94 | 1.44E+00 | | 2.61E+00 |
| | | 1089.71 | | 1.71 | 2.16E-01 | | 1.46E+01 |
| | | 1112.07 | | 13.60 | -5.28E-01 | | 1.81E+00 |
| | | 1212.93 | | 1.40 | 9.38E+00 | | 1.91E+01 |
| | | 1299.16 | | 1.63 | -9.00E+00 | | 9.80E+00 |
| | | 1408.00 | | 20.80 | 1.23E-01 | | 9.81E-01 |
| | EU-154 | 123.10 | | 40.50 | 1.19E-02 | 2.05E-01 | 2.05E-01 |
| | | 723.36 | | 19.70 | 6.32E-01 | | 1.03E+00 |
| | | 873.23 | | 11.45 | 1.03E+00 | | 2.00E+00 |
| | | 1004.78 | | 17.90 | 4.10E-01 | | 1.21E+00 |
| | | 1274.54 | | 35.50 | 1.50E-01 | | 6.59E-01 |
| | EU-155 | 86.54 | | 34.00 | 1.07E-01 | 3.20E-01 | 3.20E-01 |
| | | 105.31 | | 20.60 | -2.93E-01 | | 3.71E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 9.65E-01 | 3.29E-01 | 5.97E-01 |
| | | 77.11 | * | 17.70 | 7.81E-01 | | 3.29E-01 |
| | | 87.19 | | 6.27 | 5.08E-01 | | 1.74E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 4.24E+00 | 3.18E-01 | 3.18E+00 |
| | | 241.92 | | 7.46 | -7.84E-01 | | 2.13E+00 |
| | | 295.09 | * | 19.20 | 3.90E-01 | | 5.25E-01 |
| | | 351.87 | * | 37.10 | 3.37E-01 | | 3.27E-01 |
| | | 609.31 | * | 46.10 | 4.34E-01 | | 3.18E-01 |
| | | 1120.27 | | 15.00 | -5.32E-01 | | 1.86E+00 |
| | | 1764.49 | | 15.90 | 5.39E-01 | | 1.48E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 5.74E-01 | 2.11E-01 | 2.11E-01 |
| | | 338.42 | * | 12.40 | 4.71E-01 | | 7.26E-01 |
| | | 583.02 | * | 30.87 | 5.48E-01 | | 3.36E-01 |
| | | 911.16 | * | 29.00 | 8.09E-01 | | 4.01E-01 |
| | | 968.97 | | 17.40 | 6.95E-01 | | 1.52E+00 |
| + | U-235 | 143.79 | | 10.50 | 5.92E-01 | 1.97E-01 | 9.28E-01 |
| | | 163.38 | | 4.70 | -1.01E+00 | | 1.96E+00 |
| | | 185.74 | * | 53.00 | 2.62E-01 | | 1.97E-01 |
| | | 205.33 | | 4.70 | 2.28E-01 | | 2.38E+00 |
| + | U-238d | 63.29 | * | 3.80 | 4.18E+00 | 1.77E+00 | 1.91E+00 |
| | | 92.56 | * | 5.41 | 2.60E+00 | | 1.77E+00 |
| | AM-241 | 59.54 | | 35.70 | 4.76E-02 | 2.87E-01 | 2.87E-01 |
| | CM-243 | 99.52 | | 14.40 | -8.63E-02 | 3.41E-01 | 5.89E-01 |
| | | 103.73 | | 23.00 | -9.55E-02 | | 3.41E-01 |
| | | 116.93 | | 8.32 | 4.34E-01 | | 1.03E+00 |
| | | 228.19 | | 10.56 | -2.29E-01 | | 9.77E-01 |
| | | 277.60 | | 14.00 | 2.91E-01 | | 8.59E-01 |
| | CM-245 | 99.52 | | 21.10 | -5.89E-02 | 2.33E-01 | 4.02E-01 |
| | | 103.73 | | 33.60 | -6.54E-02 | | 2.33E-01 |
| | | 116.93 | | 12.20 | 2.96E-01 | | 7.02E-01 |
| | | 174.94 | | 9.50 | -4.20E-01 | | 1.01E+00 |

Analysis Report for RCF19405

J16J39 SAF-RC-087 FF2 618-7BG&STOCK PILES

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 07 2008 Edward S Wallace (print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19406

J16J40 SAF-RC-087 FF2 618-7BG&STOCK PILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19406 |
| Sample Description | : J16J40 SAF-RC-087 FF2 618-7BG&STOCK PILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.700E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/3/2008 7:25:00PM |
| Acquisition Started | : 4/3/2008 3:43:33PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3647.0 seconds |
| Dead Time | : 1.29 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 80g Pill Box 71385A-238 1/10/2008 |
| Sample Number | : 18440 |

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|---|
| | K-40 | | 0.999 | 1.42E+01 | 2.69E+00 | |
| X | EU-155 | | 0.373 | | | |
| | PB-212 | | 0.999 | 8.04E-01 | 1.41E-01 | |
| | RA-226d | | 0.679 | 3.75E-01 | 1.38E-01 | |
| | TH-232d | | 0.681 | 5.13E-01 | 1.59E-01 | |
| | U-235 | | 0.794 | 2.69E-01 | 1.22E-01 | |
| | U-238d | @ | 0.998 | 1.29E+00 | 1.18E+00 | |

Analysis Report for RCF19406

J16J40 SAF-RC-087 FF2 618-7BG&STOCK PILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 867.38 | | 4.21 | 3.02E+00 | | 4.94E+00 |
| | | 964.11 | | 14.50 | 1.27E+00 | | 1.66E+00 |
| | | 1085.89 | | 9.94 | 5.26E-01 | | 2.21E+00 |
| | | 1089.71 | | 1.71 | -4.50E+00 | | 1.20E+01 |
| | | 1112.07 | | 13.60 | -1.18E+00 | | 1.76E+00 |
| | | 1212.93 | | 1.40 | 5.21E+00 | | 1.81E+01 |
| | | 1299.16 | | 1.63 | 5.03E+00 | | 1.37E+01 |
| | | 1408.00 | | 20.80 | 3.38E-01 | | 1.05E+00 |
| | EU-154 | 123.10 | | 40.50 | 3.08E-02 | 2.00E-01 | 2.00E-01 |
| | | 723.36 | | 19.70 | 5.37E-01 | | 9.33E-01 |
| | | 873.23 | | 11.45 | -3.42E-01 | | 1.71E+00 |
| | | 1004.78 | | 17.90 | 2.92E-01 | | 1.17E+00 |
| | | 1274.54 | | 35.50 | 1.85E-01 | | 6.83E-01 |
| | EU-155 | 86.54 | * | 34.00 | 1.56E-01 | 1.66E-01 | 1.66E-01 |
| | | 105.31 | | 20.60 | -9.66E-02 | | 3.72E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 9.08E-01 | 3.15E-01 | 6.07E-01 |
| | | 77.11 | * | 17.70 | 7.53E-01 | | 3.15E-01 |
| | | 87.19 | * | 6.27 | 8.48E-01 | | 9.02E-01 |
| + | RA-226d | 186.11 | * | 3.28 | 4.72E+00 | 2.73E-01 | 2.73E+00 |
| | | 241.92 | | 7.46 | -3.58E-01 | | 1.87E+00 |
| | | 295.09 | * | 19.20 | 2.96E-01 | | 5.48E-01 |
| | | 351.87 | * | 37.10 | 4.27E-01 | | 2.85E-01 |
| | | 609.31 | * | 46.10 | 3.65E-01 | | 2.73E-01 |
| | | 1120.27 | | 15.00 | -9.50E-02 | | 1.70E+00 |
| | | 1764.49 | | 15.90 | 9.29E-01 | | 1.63E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 4.23E-01 | 1.90E-01 | 1.90E-01 |
| | | 338.42 | | 12.40 | 1.40E+00 | | 1.07E+00 |
| | | 583.02 | * | 30.87 | 5.18E-01 | | 4.19E-01 |
| | | 911.16 | * | 29.00 | 7.12E-01 | | 4.52E-01 |
| | | 968.97 | | 17.40 | 1.73E+00 | | 1.47E+00 |
| + | U-235 | 143.79 | * | 10.50 | 2.72E-01 | 1.69E-01 | 5.03E-01 |
| | | 163.38 | | 4.70 | 1.10E+00 | | 2.06E+00 |
| | | 185.74 | * | 53.00 | 2.92E-01 | | 1.69E-01 |
| | | 205.33 | | 4.70 | 7.46E-01 | | 2.29E+00 |
| + | U-238d | 63.29 | * | 3.80 | 1.29E+00 | 1.07E+00 | 1.91E+00 |
| | | 92.56 | * | 5.41 | 2.53E+00 | | 1.07E+00 |
| | AM-241 | 59.54 | | 35.70 | -1.22E-01 | 2.68E-01 | 2.68E-01 |
| | CM-243 | 99.52 | | 14.40 | -3.08E-01 | 3.30E-01 | 5.20E-01 |
| | | 103.73 | | 23.00 | -1.63E-01 | | 3.30E-01 |
| | | 116.93 | | 8.32 | 4.93E-01 | | 1.00E+00 |
| | | 228.19 | | 10.56 | 5.24E-01 | | 9.55E-01 |
| | | 277.60 | | 14.00 | -4.90E-01 | | 7.67E-01 |
| | CM-245 | 99.52 | | 21.10 | -2.10E-01 | 2.26E-01 | 3.55E-01 |
| | | 103.73 | | 33.60 | -1.11E-01 | | 2.26E-01 |
| | | 116.93 | | 12.20 | 3.36E-01 | | 6.85E-01 |
| | | 174.94 | | 9.50 | 1.87E-01 | | 9.75E-01 |

Analysis Report for RCF19406

J16J40 SAF-RC-087 FF2 618-7BG&STOCK PILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/3/2008 4:44:23PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|
| | 1 | 46.29 No Peak Po-210 | 9.59E-03 | 53.95 |
| M | 5 | 84.39 No Peak | 9.73E-03 | 29.72 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.42E+01 | 2.28E+00 | 2.28E+00 |
| | CO-60 | 1173.24 | | 99.90 | -7.55E-04 | 2.03E-01 | 2.07E-01 |
| | | 1332.50 | | 99.98 | -6.19E-02 | | 2.03E-01 |
| | NB-94 | 702.63 | | 99.81 | 4.76E-02 | 1.71E-01 | 1.71E-01 |
| | | 871.10 | | 99.89 | 3.28E-02 | | 1.99E-01 |
| | AG-108m | 433.94 | | 90.50 | -1.52E-01 | 1.27E-01 | 1.27E-01 |
| | | 614.28 | | 89.80 | -3.07E-02 | | 2.28E-01 |
| | | 722.94 | | 90.80 | 6.19E-02 | | 2.02E-01 |
| | CS-137 | 661.66 | | 85.21 | 2.06E-02 | 1.87E-01 | 1.87E-01 |
| | EU-152 | 40.12 | | 38.40 | 5.04E-02 | 2.12E-01 | 2.12E-01 |
| | | 45.38 | | 11.10 | 5.64E-02 | | 7.66E-01 |
| | | 121.78 | | 28.40 | 3.73E-02 | | 2.87E-01 |
| | | 244.69 | | 7.51 | -9.81E-01 | | 1.38E+00 |
| | | 344.29 | | 26.60 | -6.56E-01 | | 4.60E-01 |
| | | 411.12 | | 2.23 | 2.79E-01 | | 5.96E+00 |
| | | 443.89 | | 2.80 | -1.89E-01 | | 4.54E+00 |
| | | 778.92 | | 12.98 | -6.93E-01 | | 1.29E+00 |

Analysis Report for RCF19406

J16J40 SAF-RC-087 FF2 618-7BG&STOCK PILES

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 07 2008 (print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19407

J16J41SAF-RC-087 FF2 618-7BG&STOCK PILES

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19407 |
| Sample Description | : J16J41SAF-RC-087 FF2 618-7BG&STOCK PILES |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.200E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/3/2008 7:35:00PM |
| Acquisition Started | : 4/3/2008 3:43:40PM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/5/2008 |
| Efficiency Calibration Description | : 80g Pill box 2/5/2008 |
| Sample Number | : 18441 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.986 | 1.33E+01 | 3.88E+00 | |
| PB-212 | | 0.707 | 8.00E-01 | 1.65E-01 | |
| U-235 | | 0.551 | 4.23E-01 | 1.65E-01 | |
| U-238d | @ | 0.999 | 2.72E+00 | 1.52E+00 | |

Analysis Report for RCF19407

J16J41SAF-RC-087 FF2 618-7BG&STOCK PILES

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/3/2008 4:43:48PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|
| 6 | 238.75 Pb-212 | 3.84E-02 | 14.56 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.33E+01 | 2.38E+00 | 2.38E+00 |
| | CO-60 | 1173.24 | | 99.90 | 3.31E-03 | 2.03E-01 | 2.43E-01 |
| | | 1332.50 | | 99.98 | -4.51E-02 | | 2.03E-01 |
| | NB-94 | 702.63 | | 99.81 | 5.13E-04 | 1.63E-01 | 1.84E-01 |
| | | 871.10 | | 99.89 | 4.33E-03 | | 1.63E-01 |
| | AG-108m | 433.94 | | 90.50 | -1.30E-01 | 1.20E-01 | 1.20E-01 |
| | | 614.28 | | 89.80 | -1.72E-01 | | 2.00E-01 |
| | | 722.94 | | 90.80 | 2.24E-02 | | 2.15E-01 |
| | CS-137 | 661.66 | | 85.21 | 9.22E-02 | 1.80E-01 | 1.80E-01 |
| | EU-152 | 40.12 | | 38.40 | 3.51E-03 | 2.67E-01 | 2.73E-01 |
| | | 45.38 | | 11.10 | 4.74E-01 | | 9.14E-01 |
| | | 121.78 | | 28.40 | 1.54E-01 | | 2.67E-01 |
| | | 244.69 | | 7.51 | 1.05E+00 | | 1.36E+00 |
| | | 344.29 | | 26.60 | -2.50E-01 | | 4.00E-01 |
| | | 411.12 | | 2.23 | 1.28E+00 | | 5.51E+00 |
| | | 443.89 | | 2.80 | 4.79E-01 | | 4.61E+00 |
| | | 778.92 | | 12.98 | -2.43E-01 | | 1.30E+00 |
| | | 867.38 | | 4.21 | -9.67E-01 | | 3.97E+00 |
| | | 964.11 | | 14.50 | 8.99E-01 | | 1.62E+00 |

Analysis Report for RCF19407

J16J41SAF-RC-087 FF2 618-7BG&STOCK PILES

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 1085.89 | | 9.94 | -1.22E-01 | | 2.00E+00 |
| | | 1089.71 | | 1.71 | 8.93E+00 | | 1.36E+01 |
| | | 1112.07 | | 13.60 | -2.77E-01 | | 1.74E+00 |
| | | 1212.93 | | 1.40 | 4.73E+00 | | 1.72E+01 |
| | | 1299.16 | | 1.63 | -1.50E+00 | | 1.47E+01 |
| | | 1408.00 | | 20.80 | -3.63E-01 | | 9.67E-01 |
| | EU-154 | 123.10 | | 40.50 | 9.69E-02 | 1.86E-01 | 1.86E-01 |
| | | 723.36 | | 19.70 | 1.03E-01 | | 9.90E-01 |
| | | 873.23 | | 11.45 | -8.63E-01 | | 1.38E+00 |
| | | 1004.78 | | 17.90 | -4.03E-01 | | 1.11E+00 |
| | | 1274.54 | | 35.50 | 1.22E-01 | | 7.15E-01 |
| | EU-155 | 86.54 | | 34.00 | -1.04E-02 | 2.79E-01 | 2.79E-01 |
| | | 105.31 | | 20.60 | -2.15E-01 | | 3.22E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 6.43E-01 | 3.95E-01 | 6.65E-01 |
| | | 77.11 | * | 17.70 | 8.93E-01 | | 3.95E-01 |
| | | 87.19 | | 6.27 | 2.28E+00 | | 1.56E+00 |
| | RA-226d | 186.11 | | 3.28 | 6.43E+00 | 3.86E-01 | 3.58E+00 |
| | | 241.92 | | 7.46 | 1.18E+00 | | 1.99E+00 |
| | | 295.09 | | 19.20 | 1.21E-01 | | 6.27E-01 |
| | | 351.87 | | 37.10 | 5.03E-01 | | 3.86E-01 |
| | | 609.31 | | 46.10 | 1.39E-01 | | 4.42E-01 |
| | | 1120.27 | | 15.00 | 1.22E+00 | | 1.89E+00 |
| | | 1764.49 | | 15.90 | 1.45E+00 | | 1.83E+00 |
| | TH-232d | 238.58 | | 43.60 | 5.81E-01 | 3.36E-01 | 3.36E-01 |
| | | 338.42 | | 12.40 | 6.42E-01 | | 1.00E+00 |
| | | 583.02 | | 30.87 | 3.21E-01 | | 5.62E-01 |
| | | 911.16 | | 29.00 | 1.13E+00 | | 8.83E-01 |
| | | 968.97 | | 17.40 | 5.85E-01 | | 1.32E+00 |
| + | U-235 | 143.79 | | 10.50 | 5.71E-01 | 1.61E-01 | 8.34E-01 |
| | | 163.38 | | 4.70 | 1.05E+00 | | 1.71E+00 |
| | | 185.74 | * | 53.00 | 4.23E-01 | | 1.61E-01 |
| | | 205.33 | | 4.70 | -3.13E-01 | | 1.81E+00 |
| + | U-238d | 63.29 | * | 3.80 | 2.72E+00 | 1.84E+00 | 2.53E+00 |
| | | 92.56 | * | 5.41 | 2.38E+00 | | 1.84E+00 |
| | AM-241 | 59.54 | | 35.70 | 1.70E-01 | 2.26E-01 | 2.26E-01 |
| | CM-243 | 99.52 | | 14.40 | 9.79E-02 | 2.86E-01 | 4.87E-01 |
| | | 103.73 | | 23.00 | -6.85E-02 | | 2.86E-01 |
| | | 116.93 | | 8.32 | -3.70E-01 | | 8.80E-01 |
| | | 228.19 | | 10.56 | -4.72E-01 | | 8.34E-01 |
| | | 277.60 | | 14.00 | 2.91E-01 | | 6.82E-01 |
| | CM-245 | 99.52 | | 21.10 | 6.68E-02 | 1.96E-01 | 3.33E-01 |
| | | 103.73 | | 33.60 | -4.69E-02 | | 1.96E-01 |
| | | 116.93 | | 12.20 | -2.53E-01 | | 6.00E-01 |
| | | 174.94 | | 9.50 | -1.07E-01 | | 7.89E-01 |

Analysis Report for RCF19407

J16J41SAF-RC-087 FF2 618-7BG&STOCK PILES

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 07 2008 Edward S Wallace
(print/sign/date)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# Sample Check-in List

Date/Time Received: 4808 1050 GM Screen Result 0.1K

Client: WCH SDG #: J00166 NA[ ] SAF #: RC-087 NA [ ]

Work Order Number: J8D070175 Chain of Custody # RC-087-061,-075,-076,-077

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? NA [ ] Yes [✓] No [ ]
4. Cooler Temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 11
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ____ Tape
   - ✓ Custody Seals
   - ____ Hazard Lables
   - ✓ Appropriate Sample Lables
9. Samples are:
   - ✓ In Good Condition
   - ____ Broken
   - ____ Leaking
   - ____ Have Air Bubbles
   - (Only for samples requiring no head space.)
10. Sample pH taken? NA [✓] SOIL pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount $HNO_3$ Added _____
11. Sample Location, Sample Collector Listed? *
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: RP Date: 4 7 08

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person Contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

TESTAMERICA

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-078 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B Lawrence, E. Harries | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Project Designation<br>618-7 Burial Ground - Soil | Sampling Location<br>618-7 Burial Ground/Stockpiles | | SAF No.<br>RC-087 |
| Ice Chest No. | Field Logbook No.<br>EL-1395-12 | COA<br>RG61872600 | Method of Shipment |
| Shipped To<br>TestAmerica Incorporated, Richland | Offsite Property No. | | Bill of Lading/Air Bill No. |

Price Code: 2B

Data Turnaround: 24 Hours

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | TIE TO | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J16J62 | SOIL | 4-03-08 | 1500 | X | | | | | | | J16J42 | | |
| ~~J16J63~~ | ~~SOIL~~ | | | | | | | | | | | | |
| ~~J16J64~~ | ~~SOIL~~ | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

79 RK 4-3-08 RK 4-3-08

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| B Lawrence | 1545 4-3-08 | RB Kerkow / RB Kerkow | 1545 4/03/08 |
| RB Kerkow / RB Kerkow | 1630 4/3/08 | REF 1B, 1060, RBK | 1630 4/3/08 |
| 1060 / 1B | 4/8/08 0945 | MStankovich | 0945 4/8/08 |
| MStankovich | 1000 4/8/08 | LJLANE TALK | 1000 4/8/08 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

J8D080192
J00166
DUE 4 9 08
KKWA9

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

**Radiological Counting Facility**

Analysis Report for RCF19412

J16J42 SAF:RC-087 FF2-618-7 Burial Ground Soil Sample

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19412 |
| Sample Description | : J16J42 SAF:RC-087 FF2-618-7 Burial Ground Soil Sample |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 5.000E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/3/2008 3:00:00PM |
| Acquisition Started | : 4/7/2008 6:34:47AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : REGIE02 |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3642.9 seconds |
| Dead Time | : 1.18 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/10/2008 |
| Efficiency Calibration Used Done On | : 1/11/2008 |
| Efficiency Calibration Description | : 50g Pill Box 1-10-2008 |
| Sample Number | : 18449 |

TIE TO J16J62

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|---|
| | K-40 | | 0.999 | 1.34E+01 | 2.96E+00 | |
| X | EU-155 | | 0.388 | | | |
| | PB-212 | | 0.998 | 4.93E-01 | 1.37E-01 | |
| | RA-226d | | 0.672 | 3.53E-01 | 1.54E-01 | |
| | TH-232d | | 0.431 | 5.19E-01 | 1.73E-01 | |
| | U-235 | | 0.548 | 2.40E-01 | 1.53E-01 | |
| | U-238d | @ | 1.000 | 3.99E+00 | 1.51E+00 | |

Analysis Report for RCF19412

J16J42 SAF:RC-087 FF2-618-7 Burial Ground Soil Sample

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/7/2008 7:35:34AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.34E+01 | 2.74E+00 | 2.74E+00 |
| | CO-60 | 1173.24 | | 99.90 | -1.23E-02 | 2.66E-01 | 2.66E-01 |
| | | 1332.50 | | 99.98 | 8.79E-02 | | 2.93E-01 |
| | NB-94 | 702.63 | | 99.81 | -8.59E-02 | 2.17E-01 | 2.17E-01 |
| | | 871.10 | | 99.89 | -2.42E-01 | | 2.36E-01 |
| | AG-108m | 433.94 | | 90.50 | 1.13E-02 | 2.04E-01 | 2.04E-01 |
| | | 614.28 | | 89.80 | -5.86E-02 | | 2.97E-01 |
| | | 722.94 | | 90.80 | 1.01E-01 | | 2.72E-01 |
| | CS-137 | 661.66 | | 85.21 | 1.95E-01 | 2.75E-01 | 2.75E-01 |
| | EU-152 | 40.12 | | 38.40 | -1.73E-01 | 3.09E-01 | 3.09E-01 |
| | | 45.38 | | 11.10 | 2.95E-01 | | 1.01E+00 |
| | | 121.78 | | 28.40 | -8.97E-02 | | 3.42E-01 |
| | | 244.69 | | 7.51 | -1.40E+00 | | 1.87E+00 |
| | | 344.29 | | 26.60 | -2.18E-01 | | 6.06E-01 |
| | | 411.12 | | 2.23 | 5.89E-01 | | 7.93E+00 |
| | | 443.89 | | 2.80 | 4.30E+00 | | 6.59E+00 |
| | | 778.92 | | 12.98 | 1.14E+00 | | 1.78E+00 |
| | | 867.38 | | 4.21 | 1.27E+00 | | 6.40E+00 |

Analysis Report for RCF19412

J16J42 SAF:RC-087 FF2-618-7 Burial Ground Soil Sample

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 2.30E+00 | | 2.33E+00 |
| | | 1085.89 | | 9.94 | -1.51E+00 | | 2.39E+00 |
| | | 1089.71 | | 1.71 | -3.98E+00 | | 1.39E+01 |
| | | 1112.07 | | 13.60 | -6.33E-01 | | 2.31E+00 |
| | | 1212.93 | | 1.40 | 3.56E+00 | | 1.99E+01 |
| | | 1299.16 | | 1.63 | -1.60E+01 | | 1.50E+01 |
| | | 1408.00 | | 20.80 | -1.81E-01 | | 1.16E+00 |
| | EU-154 | 123.10 | | 40.50 | 2.13E-02 | 2.45E-01 | 2.45E-01 |
| | | 723.36 | | 19.70 | 1.33E-01 | | 1.25E+00 |
| | | 873.23 | | 11.45 | -4.33E-01 | | 2.03E+00 |
| | | 1004.78 | | 17.90 | 2.96E-01 | | 1.56E+00 |
| | | 1274.54 | | 35.50 | 1.52E-01 | | 8.07E-01 |
| | EU-155 | 86.54 | * | 34.00 | 1.01E-01 | 1.78E-01 | 1.78E-01 |
| | | 105.31 | | 20.60 | -4.29E-01 | | 4.71E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 6.16E-01 | 3.89E-01 | 6.63E-01 |
| | | 77.11 | * | 17.70 | 4.43E-01 | | 3.89E-01 |
| | | 87.19 | * | 6.27 | 5.47E-01 | | 9.65E-01 |
| + | RA-226d | 186.11 | * | 3.28 | 4.24E+00 | 3.47E-01 | 3.87E+00 |
| | | 241.92 | | 7.46 | 8.34E-02 | | 2.53E+00 |
| | | 295.09 | * | 19.20 | 5.12E-01 | | 5.95E-01 |
| | | 351.87 | * | 37.10 | 2.86E-01 | | 3.47E-01 |
| | | 609.31 | * | 46.10 | 3.71E-01 | | 4.03E-01 |
| | | 1120.27 | | 15.00 | -2.32E-01 | | 2.23E+00 |
| | | 1764.49 | | 15.90 | 1.13E+00 | | 1.99E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 4.98E-01 | 3.07E-01 | 3.07E-01 |
| | | 338.42 | | 12.40 | 4.61E-01 | | 1.46E+00 |
| | | 583.02 | * | 30.87 | 5.68E-01 | | 4.52E-01 |
| | | 911.16 | | 29.00 | 3.49E-01 | | 9.91E-01 |
| | | 968.97 | | 17.40 | 5.61E-01 | | 1.81E+00 |
| + | U-235 | 143.79 | | 10.50 | 4.03E-01 | 2.39E-01 | 1.09E+00 |
| | | 163.38 | | 4.70 | -1.66E+00 | | 2.45E+00 |
| | | 185.74 | * | 53.00 | 2.62E-01 | | 2.39E-01 |
| | | 205.33 | | 4.70 | 9.93E-01 | | 2.85E+00 |
| + | U-238d | 63.29 | * | 3.80 | 3.99E+00 | 1.14E+00 | 2.23E+00 |
| | | 92.56 | * | 5.41 | 2.44E+00 | | 1.14E+00 |
| | AM-241 | 59.54 | | 35.70 | -8.07E-03 | 3.04E-01 | 3.04E-01 |
| | CM-243 | 99.52 | | 14.40 | -4.19E-01 | 4.15E-01 | 6.93E-01 |
| | | 103.73 | | 23.00 | -5.56E-01 | | 4.15E-01 |
| | | 116.93 | | 8.32 | -5.62E-01 | | 1.19E+00 |
| | | 228.19 | | 10.56 | 2.05E-01 | | 1.23E+00 |
| | | 277.60 | | 14.00 | -2.47E-01 | | 1.03E+00 |
| | CM-245 | 99.52 | | 21.10 | -2.86E-01 | 2.84E-01 | 4.73E-01 |
| | | 103.73 | | 33.60 | -3.81E-01 | | 2.84E-01 |
| | | 116.93 | | 12.20 | -3.83E-01 | | 8.11E-01 |
| | | 174.94 | | 9.50 | -7.30E-01 | | 1.16E+00 |

Analysis Report for RCF19412

J16J42 SAF:RC-087 FF2-618-7 Burial Ground Soil Sample

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 07 2008

(print/sign/date)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Sample Check-in List

Date/Time Received: 4 8 08 1000 GM Screen Result 0.1K

Client: WCH SDG #: J00166 NA[ ] SAF #: RC-057 NA [ ]

Work Order Number: J8D080192 Chain of Custody # RC-057-078

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? NA [ ] Yes [✓] No [ ]
4. Cooler Temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 1
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ___ Tape
   - ✓ Custody Seals
   - ___ Hazard Lables
   - ✓ Appropriate Sample Lables
9. Samples are:
   - ✓ In Good Condition
   - ___ Broken
   - ___ Leaking
   - ___ Have Air Bubbles
   - (Only for samples requiring no head space.)
10. Sample pH taken? NA [✓] SOIL pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount $HNO_3$ Added _____
11. Sample Location, Sample Collector Listed? *
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: [signature] Date: 4-8 08

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person Contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

TESTAMERICA

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| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-079 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B Lawrence, E. Harries | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH | Price Code<br>2B | Data Turnaround<br>24 Hours |
| Project Designation<br>618-7 Burial Ground - Soil | Sampling Location<br>618-7 Burial Ground/Stockpiles | | SAF No.<br>RC-087 | | |
| Ice Chest No. | Field Logbook No.<br>EL-1395-12 | COA<br>RG61872600 | Method of Shipment | | |
| Shipped To<br>TestAmerica Incorporated, Richland | Offsite Property No. | | Bill of Lading/Air Bill No. | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | aG | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 60mL | | | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| J16J65 KKW83 | SOIL | 4-7-08 | 0815 | X | | | | | | SEG | G-006 |
| J16J66 KKW88 | SOIL | 4-7-08 | 0825 | X | | | | | | " | G007 |
| ~~J16J67~~ | ~~SOIL~~ | | | | | | | | | | |
| RTC 4/7/08 | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From<br>E. Harries / S. Wasson 4/7/08 0900 RTC | Received By/Stored In<br>RT COFFMAN / RT Coffman 4/7/08 0900 RTC | Date/Time |
| Relinquished By/Removed From<br>RT COFFMAN / RT Coffman 4/7/08 | Received By/Stored In<br>MJ Stankovich 4/7/08 1025 | Date/Time |
| Relinquished By/Removed From<br>MJ Stankovich 4/8/08 | Received By/Stored In<br>R L LANE TALR 4808 | Date/Time 1500 |
| Relinquished By/Removed From | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

J8D080302
J00166
DUE 4908

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

**Radiological Counting Facility**

Analysis Report for RCF19415

J16J45 SAF:RC-087 FF2/ 618-7 Burial Grounds Soil

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19415 |
| Sample Description | : J16J45 SAF:RC-087 FF2/ 618-7 Burial Grounds Soil |
| Sample Type | : 80 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 6.200E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/7/2008 8:15:00AM |
| Acquisition Started | : 4/8/2008 6:31:46AM |
| Procedure | : 80 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 80 Gram Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/5/2008 |
| Efficiency Calibration Description | : 80g Pill box 2/5/2008 |
| Sample Number | : 18491 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.993 | 1.09E+01 | 3.44E+00 | |
| PB-212 | | 0.707 | 1.06E+00 | 1.85E-01 | |
| RA-226d | | 0.674 | 3.14E-01 | 1.47E-01 | |
| TH-232d | | 0.427 | 5.50E-01 | 1.63E-01 | |
| U-235 | | 0.552 | 6.08E-01 | 2.18E-01 | |
| U-238d | e | 1.000 | 9.10E+00 | 2.14E+00 | |

Analysis Report for RCF19415

J16J45 SAF:RC-087 FF2/ 618-7 Burial Grounds Soil

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/8/2008 7:31:54AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
NP = No Peak
UK = Unknown
Errors quoted at 2.000 sigma

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.09E+01 | 2.72E+00 | 2.72E+00 |
| | CO-60 | 1173.24 | | 99.90 | -7.61E-02 | 1.83E-01 | 2.06E-01 |
| | | 1332.50 | | 99.98 | -3.31E-02 | | 1.83E-01 |
| | NB-94 | 702.63 | | 99.81 | 1.17E-02 | 1.72E-01 | 1.72E-01 |
| | | 871.10 | | 99.89 | -2.18E-02 | | 1.87E-01 |
| | AG-108m | 433.94 | | 90.50 | -7.08E-02 | 1.32E-01 | 1.32E-01 |
| | | 614.28 | | 89.80 | 1.34E-02 | | 2.18E-01 |
| | | 722.94 | | 90.80 | 2.31E-01 | | 2.16E-01 |
| | CS-137 | 661.66 | | 85.21 | 2.84E-02 | 1.89E-01 | 1.89E-01 |
| | EU-152 | 40.12 | | 38.40 | -1.73E-02 | 2.59E-01 | 2.75E-01 |
| | | 45.38 | | 11.10 | 5.97E-01 | | 9.71E-01 |
| | | 121.78 | | 28.40 | 2.66E-03 | | 2.59E-01 |
| | | 244.69 | | 7.51 | 4.09E-01 | | 1.40E+00 |
| | | 344.29 | | 26.60 | -1.19E-01 | | 4.03E-01 |
| | | 411.12 | | 2.23 | -1.85E+00 | | 5.54E+00 |
| | | 443.89 | | 2.80 | 1.71E+00 | | 4.72E+00 |
| | | 778.92 | | 12.98 | -7.85E-01 | | 1.28E+00 |
| | | 867.38 | | 4.21 | -1.04E+00 | | 4.73E+00 |

Analysis Report for RCF19415

J16J45 SAF:RC-087 FF2/ 618-7 Burial Grounds Soil

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 1.77E-01 | | 1.59E+00 |
| | | 1085.89 | | 9.94 | -1.67E-01 | | 2.07E+00 |
| | | 1089.71 | | 1.71 | 7.60E+00 | | 1.29E+01 |
| | | 1112.07 | | 13.60 | -9.44E-01 | | 1.68E+00 |
| | | 1212.93 | | 1.40 | 7.20E+00 | | 1.67E+01 |
| | | 1299.16 | | 1.63 | 5.30E-01 | | 1.40E+01 |
| | | 1408.00 | | 20.80 | 3.76E-01 | | 1.13E+00 |
| | EU-154 | 123.10 | | 40.50 | 4.32E-02 | 1.81E-01 | 1.81E-01 |
| | | 723.36 | | 19.70 | 1.07E+00 | | 9.97E-01 |
| | | 873.23 | | 11.45 | -2.93E-01 | | 1.60E+00 |
| | | 1004.78 | | 17.90 | -4.03E-01 | | 1.22E+00 |
| | | 1274.54 | | 35.50 | -2.52E-01 | | 5.76E-01 |
| | EU-155 | 86.54 | | 34.00 | 1.66E-01 | 3.23E-01 | 3.23E-01 |
| | | 105.31 | | 20.60 | -1.83E-02 | | 3.86E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 1.18E+00 | 4.70E-01 | 7.37E-01 |
| | | 77.11 | * | 17.70 | 1.00E+00 | | 4.70E-01 |
| | | 87.19 | | 6.27 | 6.35E-01 | | 1.75E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 1.01E+01 | 3.28E-01 | 2.84E+00 |
| | | 241.92 | | 7.46 | 2.06E-01 | | 2.02E+00 |
| | | 295.09 | * | 19.20 | 3.76E-01 | | 4.52E-01 |
| | | 351.87 | * | 37.10 | 3.69E-01 | | 3.28E-01 |
| | | 609.31 | * | 46.10 | 2.25E-01 | | 3.78E-01 |
| | | 1120.27 | | 15.00 | 7.39E-01 | | 1.63E+00 |
| | | 1764.49 | | 15.90 | 1.50E+00 | | 1.86E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 5.33E-01 | 1.85E-01 | 1.85E-01 |
| | | 338.42 | | 12.40 | 3.08E-01 | | 1.03E+00 |
| | | 583.02 | * | 30.87 | 5.82E-01 | | 3.66E-01 |
| | | 911.16 | | 29.00 | 1.29E-01 | | 8.27E-01 |
| | | 968.97 | | 17.40 | 1.46E+00 | | 1.50E+00 |
| + | U-235 | 143.79 | | 10.50 | 4.25E-01 | 1.75E-01 | 8.39E-01 |
| | | 163.38 | | 4.70 | -7.52E-01 | | 1.76E+00 |
| | | 185.74 | * | 53.00 | 6.28E-01 | | 1.75E-01 |
| | | 205.33 | | 4.70 | -5.10E-01 | | 1.87E+00 |
| + | U-238d | 63.29 | * | 3.80 | 9.10E+00 | 1.82E+00 | 2.76E+00 |
| | | 92.56 | * | 5.41 | 8.45E+00 | | 1.82E+00 |
| | AM-241 | 59.54 | | 35.70 | -3.52E-02 | 2.52E-01 | 2.52E-01 |
| | CM-243 | 99.52 | | 14.40 | 1.99E-01 | 3.41E-01 | 5.34E-01 |
| | | 103.73 | | 23.00 | 8.40E-02 | | 3.41E-01 |
| | | 116.93 | | 8.32 | -7.60E-02 | | 9.40E-01 |
| | | 228.19 | | 10.56 | 2.50E-01 | | 8.59E-01 |
| | | 277.60 | | 14.00 | 1.85E-03 | | 7.46E-01 |
| | CM-245 | 99.52 | | 21.10 | 1.36E-01 | 2.33E-01 | 3.64E-01 |
| | | 103.73 | | 33.60 | 5.75E-02 | | 2.33E-01 |
| | | 116.93 | | 12.20 | -5.18E-02 | | 6.41E-01 |
| | | 174.94 | | 9.50 | 4.60E-01 | | 8.75E-01 |

Analysis Report for RCF19415

J16J45 SAF:RC-087 FF2/ 618-7 Burial Grounds Soil

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 08 2008 Edward S Wallace
(print/sign/date)

**Radiological Counting Facility**

Analysis Report for RCF19416

J16J46 SAF:RC-087 FF2/618-7 Burial Ground Soil

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19416 |
| Sample Description | : J16J46 SAF:RC-087 FF2/618-7 Burial Ground Soil |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 5.500E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/7/2008 8:25:00AM |
| Acquisition Started | : 4/8/2008 7:33:04AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/4/2008 |
| Efficiency Calibration Description | : 50ml Pill Box (1234-95-2) 2/4/2008 |
| Sample Number | : 18495 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.999 | 1.52E+01 | 3.68E+00 | |
| PB-212 | | 0.709 | 9.36E-01 | 2.11E-01 | |
| RA-226d | | 0.672 | 5.06E-01 | 2.12E-01 | |
| TH-232d | | 0.420 | 8.30E-01 | 2.40E-01 | |
| U-235 | | 0.540 | 1.68E-01 | 1.83E-01 | |
| U-238d | @ | 0.999 | 1.86E+00 | 1.94E+00 | |

Analysis Report for RCF19416

J16J46 SAF:RC-087 FF2/618-7 Burial Ground Soil

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/8/2008 8:33:12AM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.52E+01 | 4.18E+00 | 4.18E+00 |
| | CO-60 | 1173.24 | | 99.90 | -4.71E-02 | 2.74E-01 | 2.90E-01 |
| | | 1332.50 | | 99.98 | 9.33E-02 | | 2.74E-01 |
| | NB-94 | 702.63 | | 99.81 | -1.33E-01 | 2.62E-01 | 2.65E-01 |
| | | 871.10 | | 99.89 | -4.08E-02 | | 2.62E-01 |
| | AG-108m | 433.94 | | 90.50 | -4.80E-02 | 2.30E-01 | 2.30E-01 |
| | | 614.28 | | 89.80 | 9.07E-02 | | 3.06E-01 |
| | | 722.94 | | 90.80 | -2.18E-03 | | 3.17E-01 |
| | CS-137 | 661.66 | | 85.21 | 1.40E-01 | 2.89E-01 | 2.89E-01 |
| | EU-152 | 40.12 | | 38.40 | -8.83E-02 | 3.30E-01 | 3.30E-01 |
| | | 45.38 | | 11.10 | -4.25E-02 | | 1.05E+00 |
| | | 121.78 | | 28.40 | 1.33E-02 | | 3.43E-01 |
| | | 244.69 | | 7.51 | -2.34E-01 | | 1.93E+00 |
| | | 344.29 | | 26.60 | -2.47E-01 | | 6.38E-01 |
| | | 411.12 | | 2.23 | -5.45E-01 | | 8.46E+00 |
| | | 443.89 | | 2.80 | -3.83E-01 | | 6.41E+00 |
| | | 778.92 | | 12.98 | 9.21E-01 | | 2.03E+00 |
| | | 867.38 | | 4.21 | -1.98E+00 | | 6.57E+00 |

Analysis Report for RCF19416

J16J46 SAF:RC-087 FF2/618-7 Burial Ground Soil

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 964.11 | | 14.50 | 1.04E+00 | | 2.34E+00 |
| | | 1085.89 | | 9.94 | -2.70E-01 | | 3.11E+00 |
| | | 1089.71 | | 1.71 | -7.57E+00 | | 1.69E+01 |
| | | 1112.07 | | 13.60 | -3.02E-01 | | 2.16E+00 |
| | | 1212.93 | | 1.40 | 2.69E+01 | | 2.84E+01 |
| | | 1299.16 | | 1.63 | -1.26E+01 | | 2.02E+01 |
| | | 1408.00 | | 20.80 | -4.43E-01 | | 1.42E+00 |
| | EU-154 | 123.10 | | 40.50 | 3.77E-02 | 2.46E-01 | 2.46E-01 |
| | | 723.36 | | 19.70 | -1.00E-02 | | 1.46E+00 |
| | | 873.23 | | 11.45 | 1.73E-01 | | 2.32E+00 |
| | | 1004.78 | | 17.90 | -8.06E-01 | | 1.65E+00 |
| | | 1274.54 | | 35.50 | -2.79E-01 | | 7.96E-01 |
| | EU-155 | 86.54 | | 34.00 | 4.28E-01 | 3.59E-01 | 3.59E-01 |
| | | 105.31 | | 20.60 | -3.36E-02 | | 4.40E-01 |
| + | PB-212 | 74.81 | * | 10.50 | 8.84E-01 | 4.94E-01 | 9.01E-01 |
| | | 77.11 | * | 17.70 | 9.61E-01 | | 4.94E-01 |
| | | 87.19 | | 6.27 | 2.49E+00 | | 1.97E+00 |
| + | RA-226d | 186.11 | * | 3.28 | 3.22E+00 | 5.08E-01 | 4.77E+00 |
| | | 241.92 | | 7.46 | 1.62E-01 | | 3.20E+00 |
| | | 295.09 | * | 19.20 | 7.41E-01 | | 8.53E-01 |
| | | 351.87 | * | 37.10 | 6.69E-01 | | 5.18E-01 |
| | | 609.31 | * | 46.10 | 2.91E-01 | | 5.08E-01 |
| | | 1120.27 | | 15.00 | 5.40E-01 | | 2.41E+00 |
| | | 1764.49 | | 15.90 | -4.43E-01 | | 2.27E+00 |
| + | TH-232d | 238.58 | * | 43.60 | 8.97E-01 | 4.14E-01 | 4.14E-01 |
| | | 338.42 | | 12.40 | 7.30E-01 | | 1.49E+00 |
| | | 583.02 | * | 30.87 | 6.88E-01 | | 6.38E-01 |
| | | 911.16 | | 29.00 | 1.45E+00 | | 1.27E+00 |
| | | 968.97 | | 17.40 | 1.50E+00 | | 2.05E+00 |
| + | U-235 | 143.79 | | 10.50 | 2.84E-02 | 2.95E-01 | 9.87E-01 |
| | | 163.38 | | 4.70 | -1.07E+00 | | 2.45E+00 |
| | | 185.74 | * | 53.00 | 1.99E-01 | | 2.95E-01 |
| | | 205.33 | | 4.70 | 1.04E+00 | | 3.05E+00 |
| + | U-238d | 63.29 | * | 3.80 | 1.86E+00 | 2.15E+00 | 3.16E+00 |
| | | 92.56 | * | 5.41 | 2.48E+00 | | 2.15E+00 |
| | AM-241 | 59.54 | | 35.70 | 1.49E-01 | 2.60E-01 | 2.60E-01 |
| | CM-243 | 99.52 | | 14.40 | 1.91E-01 | 3.88E-01 | 6.49E-01 |
| | | 103.73 | | 23.00 | -5.28E-02 | | 3.88E-01 |
| | | 116.93 | | 8.32 | -1.15E+00 | | 1.05E+00 |
| | | 228.19 | | 10.56 | -1.39E+00 | | 1.21E+00 |
| | | 277.60 | | 14.00 | 2.47E-01 | | 1.08E+00 |
| | CM-245 | 99.52 | | 21.10 | 1.30E-01 | 2.66E-01 | 4.43E-01 |
| | | 103.73 | | 33.60 | -3.61E-02 | | 2.66E-01 |
| | | 116.93 | | 12.20 | -7.87E-01 | | 7.13E-01 |
| | | 174.94 | | 9.50 | -7.05E-01 | | 1.28E+00 |

Analysis Report for RCF19416

J16J46 SAF:RC-087 FF2/618-7 Burial Ground Soil

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: EDWARD S. WALLACE

APR 08 2008 Edward S Wallace
(print/sign/date)

TESTAMERICA

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-072 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B Lawrence, E. Harries | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH | Price Code | Data Turnaround<br>24 Hours |
| Project Designation<br>618-7 Burial Ground - Soil | Sampling Location<br>618-7 Burial Ground/Stockpiles | | SAF No.<br>RC-087 | | |
| Ice Chest No. | Field Logbook No.<br>EL-1395-12 | COA<br>RG61872600 | Method of Shipment | | |
| Shipped To<br>Radiological Counting Facility | Offsite Property No. | | Bill of Lading/Air Bill No. | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | Snap Vial | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 80g | | | | | | | | | | |
| SAMPLE ANALYSIS | RCF GEA Shipping Screen | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | RCF | | | | | | |
| J16J45 | SOIL | 4-7-08 | 0815 | X | 19415 | | | | | SGG | G-006 |
| J16J46 | SOIL | 4-7-08 | 0825 | X | 19416 | | | | | v | G-007 |
| ~~J16J47~~ | ~~SOIL~~ | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

RC 4/7/08

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| E. Harries / E. Harries | 4/7/08 0908 | RT Coffman / RT Coffman | 4/7/08 0908 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| RT Coffman / RT Coffman | 4/7/08 0925 | [illegible] | 4/7/08 0925 RCF |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

COPY

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

RCF 19416

TESTAMERICA

95

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-072 | Page 1 of 1 |
|---|---|---|---|
| Collector: B Lawrence, E. Harries | Company Contact: Joan Kessner; Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH | Price Code / Data Turnaround: 24 Hours |
| Project Designation: 618-7 Burial Ground - Soil | Sampling Location: 618-7 Burial Ground/Stockpiles | SAF No.: RC-087 | |
| Ice Chest No. | Field Logbook No.: EL-1395-12; COA: RG61872600 | Method of Shipment | |
| Shipped To: Radiological Counting Facility | Offsite Property No. | Bill of Lading/Air Bill No. | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | Snap Vial | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 80g | | | | | | | | | | |
| SAMPLE ANALYSIS | RCF GEA Shipping Screen | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | RCF | | | | | | |
| J16J45 | SOIL | 4-7-08 | 0815 | X | 19415 | | | | | Sign | G-006 |
| J16J46 | SOIL | 4-7-08 | 0825 | X | 19416 | | | | | ✓ | G-007 |
| ~~J16J47~~ | ~~SOIL~~ | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

R 4/7/08

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| E. Harries / E. Harries | 4/7/08 0908 | RT Coffman / RT Coffman | 4/7/08 0900 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| RT Coffman / RT Coffman | 4/7/08 0925 | [illegible] | 4/7/08 0925 RCF |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

None

COPY

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date Time |

WCH-EE-011

RCF 19415

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# Sample Check-in List

Date/Time Received: 4 8 08 1500 GM Screen Result 0.1 K

Client: WCH SDG #: J00166 NA[ ] SAF #: RC-087 NA [ ]

Work Order Number: J8D080302 Chain of Custody # RC-087-079

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? NA [ ] Yes [✓] No [ ]
4. Cooler Temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 2
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ____ Tape
   - ✓ Custody Seals
   - ____ Hazard Lables
   - ✓ Appropriate Sample Lables
9. Samples are:
   - ✓ In Good Condition
   - ____ Broken
   - ____ Leaking
   - ____ Have Air Bubbles
   - (Only for samples requiring no head space.)
10. Sample pH taken? NA [✓] SOIL pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount $HNO_3$ Added _____
11. Sample Location, Sample Collector Listed? *
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: RJL Date: 4 8 08

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person Contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

TESTAMERICA

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| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-0788 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** B Lawrence, E. Harries | **Company Contact** Joan Kessner **Telephone No.** 509-375-4688 | **Project Coordinator** KESSNER, JH | **Price Code** 2B **Data Turnaround** 24 Hours |
| **Project Designation** 618-7 Burial Ground - Soil | **Sampling Location** 618-7 Burial Ground/Stockpiles | **SAF No.** RC-087 | |
| **Ice Chest No.** | **Field Logbook No.** EL-1395-12 **COA** RG61872600 | **Method of Shipment** | |
| **Shipped To** TestAmerica Incorporated, Richland | **Offsite Property No.** | **Bill of Lading/Air Bill No.** | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | None | | | | | | | | | | |
| **Type of Container** | aG | | | | | | | | | | |
| **No. of Container(s)** | 1 | | | | | | | | | | |
| **Volume** | 60mL | | | | | | | | | | |
| **SAMPLE ANALYSIS** | See item (1) in Special Instructions. | | | | | | | | | Tie To | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~J16J62~~ | ~~SOIL~~ | ~~4/4/08~~ | | | | | | | | | | | |
| J16J63 KKOCW | SOIL | 4.4.08 | 0805 | X | | | | | | | | J16J43 | |
| J16J64 KKOC2 | SOIL | 4.4.08 | 0810 | X | | | | | | | | J16J43 | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names |
|---|---|
| Relinquished By/Removed From E. Harries/E. Harries Date/Time 0845 4/4/08 | Received By/Stored In R. Fahlberg R. Fahlberg Date/Time 0845 4.4.08 |
| Relinquished By/Removed From R. Fahlberg R. Fahlberg Date/Time 0930 4.4.08 | Received By/Stored In R. Fahlberg 4.4.08 Date/Time 0930 Ref 1A Shipping Facility |
| Relinquished By/Removed From 1060/1A 4/9/08 Date/Time 0900 | Received By/Stored In MS Tankovich 4/9/08 Date/Time 0900 |
| Relinquished By/Removed From WCH MS Tankovich 4/9/08 Date/Time 0905 | Received By/Stored In R. Lilane THLR 4908 Date/Time 0905 |
| Relinquished By/Removed From Date/Time | Received By/Stored In Date/Time |
| Relinquished By/Removed From Date/Time | Received By/Stored In Date/Time |

**SPECIAL INSTRUCTIONS**

None

(1) Metals by ICP - 6010 - Quick Turn {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP - 6010 - Quick Turn (Add On) {Aluminum, Beryllium, Copper, Iron, Zinc, Zirconium}

J8D090173
J00166
DUE 4 10 08

Matrix *
S=Soil
SE=Sediment
SO=Solid
St=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
Vs=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

**Radiological Counting Facility**

Analysis Report for RCF19426

J16HF8,J16HN0,J16HP6,J16HM4-6,J16D65 SAF:RC-001 300PS/321 Bldg

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19426 |
| Sample Description | : J16HF8,J16HN0,J16HP6,J16HM4-6,J16D65 SAF:RC-001 300PS/321 Bldg |
| Sample Type | : Non Standard Geo |
| Unit | : |
| Sample Point | |
| Sample Size | : 1.000E+00 units |
| Facility | : Default |
| Sample Taken On | : 4/7/2008 12:00:00PM |
| Acquisition Started | : 4/8/2008 3:14:20PM |
| Procedure | : Non Standard Geometry |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : Non Standard Geo |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.6 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/4/2008 |
| Efficiency Calibration Description | : Non-Standard Geo (1234-95-2) 2/4/2008 |
| Sample Number | : 18512 |

**Qualitative Only**

**Non-Standard Geometry**

Calibrations for determining sample activity are geometry-specific. This sample does not conform to one of the currently calibrated geometries. Reported activities may differ from the acutal sample activity for this reason.

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/unit) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| PB-212 | 0.708 | 2.03E+01 | 9.63E+00 | |
| RA-226d | 0.828 | 6.29E+01 | 1.27E+01 | |

Analysis Report for RCF19426

J16HF8,J16HN0,J16HP6,J16HM4-6,J16D65 SAF:RC-001 300PS/321 Bldg

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium
Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/8/2008 4:14:28PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|

All peaks were identified.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NP = No Peak
UK = Unknown

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/units) | Nuclide MDA (pCi/units) | Line MDA (pCi/units) |
|---|---|---|---|---|---|
| K-40 | 1460.83 | 10.67 | 2.34E+02 | 2.58E+02 | 2.58E+02 |
| CO-60 | 1173.24 | 99.90 | 4.69E+00 | 1.70E+01 | 1.70E+01 |
| | 1332.50 | 99.98 | 1.84E+00 | | 1.74E+01 |
| NB-94 | 702.63 | 99.81 | -7.04E+00 | 1.33E+01 | 1.34E+01 |
| | 871.10 | 99.89 | 1.85E+00 | | 1.33E+01 |
| AG-108m | 433.94 | 90.50 | 8.90E-01 | 1.02E+01 | 1.02E+01 |
| | 614.28 | 89.80 | -2.19E+01 | | 2.02E+01 |
| | 722.94 | 90.80 | 8.63E-01 | | 1.34E+01 |
| CS-137 | 661.66 | 85.21 | 2.12E+00 | 1.41E+01 | 1.41E+01 |
| EU-152 | 40.12 | 38.40 | -1.10E+00 | 1.40E+01 | 1.40E+01 |
| | 45.38 | 11.10 | 2.54E+01 | | 5.30E+01 |
| | 121.78 | 28.40 | -2.83E+00 | | 1.60E+01 |
| | 244.69 | 7.51 | 8.69E+01 | | 1.14E+02 |
| | 344.29 | 26.60 | 6.27E+00 | | 3.66E+01 |
| | 411.12 | 2.23 | -1.76E+02 | | 3.96E+02 |
| | 443.89 | 2.80 | -2.10E+02 | | 2.97E+02 |
| | 778.92 | 12.98 | -2.03E+01 | | 8.40E+01 |
| | 867.38 | 4.21 | -9.42E+01 | | 3.15E+02 |
| | 964.11 | 14.50 | 3.07E+01 | | 1.09E+02 |
| | 1085.89 | 9.94 | 6.12E+00 | | 1.59E+02 |

Analysis Report for RCF19426

J16HF8,J16HN0,J16HP6,J16HM4-6,J16D65 SAF:RC-001 300PS/321 Bldg

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/units) | Nuclide MDA (pCi/units) | Line MDA (pCi/units) |
|---|---|---|---|---|---|---|---|
| | | 1089.71 | | 1.71 | -1.28E+02 | | 9.12E+02 |
| | | 1112.07 | | 13.60 | -1.10E+02 | | 1.20E+02 |
| | | 1212.93 | | 1.40 | -4.53E+02 | | 9.57E+02 |
| | | 1299.16 | | 1.63 | 3.56E+01 | | 8.97E+02 |
| | | 1408.00 | | 20.80 | 8.28E+00 | | 8.62E+01 |
| | EU-154 | 123.10 | | 40.50 | -7.66E+00 | 1.10E+01 | 1.10E+01 |
| | | 723.36 | | 19.70 | 3.98E+00 | | 6.17E+01 |
| | | 873.23 | | 11.45 | -6.93E+01 | | 1.15E+02 |
| | | 1004.78 | | 17.90 | -2.32E+01 | | 7.55E+01 |
| | | 1274.54 | | 35.50 | 5.70E+00 | | 4.25E+01 |
| | EU-155 | 86.54 | | 34.00 | 1.29E+01 | 1.53E+01 | 1.53E+01 |
| | | 105.31 | | 20.60 | -2.23E+00 | | 2.01E+01 |
| + | PB-212 | 74.81 | * | 10.50 | 2.82E+01 | 2.36E+01 | 3.92E+01 |
| | | 77.11 | * | 17.70 | 1.76E+01 | | 2.36E+01 |
| | | 87.19 | | 6.27 | 6.88E+01 | | 8.35E+01 |
| + | RA-226d | 186.11 | | 3.28 | 1.75E+02 | 2.68E+01 | 2.33E+02 |
| | | 241.92 | | 7.46 | 5.55E+01 | | 1.26E+02 |
| | | 295.09 | * | 19.20 | 5.07E+01 | | 4.72E+01 |
| | | 351.87 | * | 37.10 | 5.53E+01 | | 3.03E+01 |
| | | 609.31 | * | 46.10 | 7.03E+01 | | 2.68E+01 |
| | | 1120.27 | * | 15.00 | 9.81E+01 | | 8.66E+01 |
| | | 1764.49 | * | 15.90 | 7.80E+01 | | 8.75E+01 |
| | TH-232d | 238.58 | | 43.60 | 2.25E+00 | 2.04E+01 | 2.04E+01 |
| | | 338.42 | | 12.40 | -8.29E+00 | | 7.59E+01 |
| | | 583.02 | | 30.87 | 3.09E+01 | | 4.32E+01 |
| | | 911.16 | | 29.00 | -4.25E+00 | | 4.85E+01 |
| | | 968.97 | | 17.40 | -1.30E+01 | | 8.67E+01 |
| | U-235 | 143.79 | | 10.50 | -4.65E+01 | 1.44E+01 | 4.87E+01 |
| | | 163.38 | | 4.70 | -3.31E+01 | | 1.28E+02 |
| | | 185.74 | | 53.00 | 1.08E+01 | | 1.44E+01 |
| | | 205.33 | | 4.70 | -1.52E+02 | | 1.41E+02 |
| | U-238d | 63.29 | | 3.80 | 1.32E+02 | 1.02E+02 | 1.25E+02 |
| | | 92.56 | | 5.41 | 5.56E+01 | | 1.02E+02 |
| | AM-241 | 59.54 | | 35.70 | 1.36E+00 | 1.14E+01 | 1.14E+01 |
| | CM-243 | 99.52 | | 14.40 | 2.69E+01 | 1.79E+01 | 3.05E+01 |
| | | 103.73 | | 23.00 | -2.36E+00 | | 1.79E+01 |
| | | 116.93 | | 8.32 | 7.08E+00 | | 5.86E+01 |
| | | 228.19 | | 10.56 | 2.20E+01 | | 7.41E+01 |
| | | 277.60 | | 14.00 | 1.65E+01 | | 5.79E+01 |
| | CM-245 | 99.52 | | 21.10 | 1.84E+01 | 1.22E+01 | 2.08E+01 |
| | | 103.73 | | 33.60 | -1.61E+00 | | 1.22E+01 |
| | | 116.93 | | 12.20 | 4.82E+00 | | 4.00E+01 |
| | | 174.94 | | 9.50 | 2.05E+01 | | 6.73E+01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Analysis Report for RCF19426

J16HF8,J16HN0,J16HP6,J16HM4-6,J16D65 SAF:RC-001 300PS/321 Bldg

Reviewed and Approved: EDWARD S. WALLACE

APR 08 2008 Edward S Wallace

(print/sign/date)

TESTAMERICA

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Hanford's River Corridor Closure Project

# Washington Closure Hanford

Survey Number 040708-300-321 -jrb

Sampling Date 4/7/2008

## Chain of Custody / Sample Analysis Request

Data Turnaround
- [ ] 24 Hours
- [x] Standard

- [ ] Ghost Wipe
- [ ] Other Wipe

IH Technician BRUNSON, JEFFREY R

Company Contact HENRY RUBY / 509-531-1229

Type of Sample Personal

Location 321

Shipped To DataChem Salt Lake City

COA R32100 J451

Possible Hazards NA

Method NIOSH 7400/7300

Special Handling NA

Project Coordinato Joan H. Kessner

SAF Number: RC-001

Method of Shipment:

Bill of Lading / Air Bill No:

| Sample ID | Air | Wipe | Bulk | Other | Blank | Volume | Comments | Asbestos | Beryllium | Lead | Cadmium | Chromium | Dust | hex | Hg | Silica |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ J16HF8 | ☐ | ☐ | ☐ | ☐ | ☑ | | Metals Perimeter Blank (in RBA) | ☐ | ☑ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16HN0 | ☑ | ☐ | ☐ | ☐ | ☐ | 1133.21 | Metals Perimeter (in RBA) | ☐ | ☑ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16HM3 | ☑ | ☐ | ☐ | ☐ | ☐ | 627.655 | Metal Personal-Scott Murbach | ☐ | ☑ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16HP6 | ☑ | ☐ | ☐ | ☐ | ☐ | 324.52 | Metal Personal-Jerry Hunt | ☐ | ☑ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16HM4 | ☑ | ☐ | ☐ | ☐ | ☐ | 87.45 | Excursion-Tom Murbach | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16HM5 | ☑ | ☐ | ☐ | ☐ | ☐ | 233.2 | Asbestos Personal (AM)-Tom Murbach | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16HM6 | ☑ | ☐ | ☐ | ☐ | ☐ | 349.8 | Asbestos Personal (PM)-Tom Murbach | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| ✓ J16D65 | ☐ | ☐ | ☐ | ☐ | ☑ | | Asbestos Personal Blank | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

RCF 19426

COPY

Hanford's River Corridor Closure Project

# Washington Closure Hanford

## Chain of Custody / Sample Analysis Request

Enter the First Sample Number from Page 1 J16HF8

| Relinquished By / Stored | Date / Time | Received By / Stored | Date / Time |
|---|---|---|---|
| Jeff Bruson | 4-7-08 1630 | 300/324/ Locked room 212 | 4-7-08 1630 |
| Yetta D Jones 300/324 locked room 212 | 4-08-08 1310 | MStankovich | 4/8/08 1310 |
| MStankovich | 4/8/08 1320 | R Zimmerman RCF | 4/8/08 1320 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**LABORATORY SECTION**

Received By _____ Title _____ Date / Time _____

COPY

Reviewed By _____ Date _____

TESTAMERICA

**Radiological Counting Facility**

Analysis Report for RCF19418

J16J44 SAF:RC-087 FF2/618-7 Burial Gound Soil

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : RCF19418 |
| Sample Description | : J16J44 SAF:RC-087 FF2/618-7 Burial Gound Soil |
| Sample Type | : 50 gram pill box |
| Unit | : |
| Sample Point | |
| Sample Size | : 5.200E+01 grams |
| Facility | : Default |
| Sample Taken On | : 4/4/2008 8:10:00AM |
| Acquisition Started | : 4/8/2008 11:52:03AM |
| Procedure | : 50 gram pill box |
| Operator | : RCT |
| Detector Name | : PGTWHITE |
| Geometry | : 50 ml Pill Box |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.7 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 3.00 |
| Peak Locate Range (in channels) | : 80 - 4096 |
| Peak Area Range (in channels) | : 80 - 4096 |
| Identification Energy Tolerance | : 1.300 keV |
| Energy Calibration Used Done On | : 1/31/2008 |
| Efficiency Calibration Used Done On | : 2/4/2008 |
| Efficiency Calibration Description | : 50ml Pill Box (1234-95-2) 2/4/2008 |
| Sample Number | : 18509 |

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| K-40 | | 0.999 | 1.54E+01 | 3.52E+00 | |
| U-235 | | 0.540 | 7.57E-01 | 2.01E-01 | |
| U-238d | @ | 1.000 | 9.14E+00 | 2.70E+00 | |

Analysis Report for RCF19418

J16J44 SAF:RC-087 FF2/618-7 Burial Gound Soil

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity
d = identified by daughter product energy lines assumed to be in secular equilibrium

Errors quoted at 2.000 sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 4/8/2008 12:52:10PM
Peak Locate From Channel : 80
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | | Peak Rate (CPS) | Peak Rate (%) Uncertainty |
|---|---|---|---|---|
| 1 | 46.60 | Pb-210 | 1.20E-02 | 45.41 |
| 3 | 77.22 | Pb-212 | 1.71E-02 | 48.65 |
| 6 | 238.56 | Pb-212 | 1.55E-02 | 33.74 |
| 7 | 295.32 | Pb-214 | 1.36E-02 | 29.67 |
| 8 | 351.92 | Pb-214 | 1.20E-02 | 33.58 |
| 9 | 969.40 | Ac-228 | 3.16E-03 | 50.55 |

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
NP = No Peak
UK = Unknown
Errors quoted at 2.000 sigma

## NUCLIDE MDA REPORT

Nuclide Library Used : \\GOZER\ApexRoot\Default\Library\RCF UNKNOWN.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | K-40 | 1460.83 | * | 10.67 | 1.54E+01 | 3.54E+00 | 3.54E+00 |
| | CO-60 | 1173.24 | | 99.90 | -7.90E-02 | 3.05E-01 | 3.43E-01 |
| | | 1332.50 | | 99.98 | 3.31E-03 | | 3.05E-01 |
| | NB-94 | 702.63 | | 99.81 | -3.06E-02 | 2.24E-01 | 2.78E-01 |
| | | 871.10 | | 99.89 | -6.47E-02 | | 2.24E-01 |
| | AG-108m | 433.94 | | 90.50 | -1.54E-01 | 1.98E-01 | 1.98E-01 |
| | | 614.28 | | 89.80 | -1.07E-02 | | 3.06E-01 |
| | | 722.94 | | 90.80 | -1.32E-01 | | 2.98E-01 |
| | CS-137 | 661.66 | | 85.21 | -5.05E-03 | 2.70E-01 | 2.70E-01 |
| | EU-152 | 40.12 | | 38.40 | 7.89E-02 | 3.65E-01 | 3.73E-01 |
| | | 45.38 | | 11.10 | -1.59E-01 | | 1.30E+00 |
| | | 121.78 | | 28.40 | 1.78E-01 | | 3.65E-01 |
| | | 244.69 | | 7.51 | 8.72E-01 | | 2.40E+00 |
| | | 344.29 | | 26.60 | -3.43E-01 | | 6.37E-01 |
| | | 411.12 | | 2.23 | -2.52E+00 | | 7.98E+00 |

Analysis Report for RCF19418

J16J44 SAF:RC-087 FF2/618-7 Burial Gound Soil

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | 443.89 | | 2.80 | 4.52E+00 | | 8.39E+00 |
| | | 778.92 | | 12.98 | -5.21E-01 | | 2.15E+00 |
| | | 867.38 | | 4.21 | -5.15E+00 | | 5.50E+00 |
| | | 964.11 | | 14.50 | -1.60E+00 | | 2.41E+00 |
| | | 1085.89 | | 9.94 | -8.00E-01 | | 2.82E+00 |
| | | 1089.71 | | 1.71 | 1.48E+00 | | 1.64E+01 |
| | | 1112.07 | | 13.60 | 1.75E+00 | | 2.65E+00 |
| | | 1212.93 | | 1.40 | 7.70E+00 | | 2.37E+01 |
| | | 1299.16 | | 1.63 | 9.60E+00 | | 2.06E+01 |
| | | 1408.00 | | 20.80 | 4.13E-01 | | 1.64E+00 |
| | EU-154 | 123.10 | | 40.50 | -1.90E-02 | 2.55E-01 | 2.55E-01 |
| | | 723.36 | | 19.70 | -6.09E-01 | | 1.37E+00 |
| | | 873.23 | | 11.45 | -5.95E-01 | | 2.11E+00 |
| | | 1004.78 | | 17.90 | 7.58E-01 | | 1.97E+00 |
| | | 1274.54 | | 35.50 | 4.43E-01 | | 9.63E-01 |
| | EU-155 | 86.54 | | 34.00 | -9.38E-02 | 4.12E-01 | 4.12E-01 |
| | | 105.31 | | 20.60 | -3.06E-01 | | 5.07E-01 |
| | PB-212 | 74.81 | | 10.50 | -1.19E-02 | 9.50E-01 | 1.36E+00 |
| | | 77.11 | | 17.70 | 1.41E+00 | | 9.50E-01 |
| | | 87.19 | | 6.27 | 1.90E+00 | | 2.30E+00 |
| | RA-226d | 186.11 | | 3.28 | 1.53E+01 | 6.64E-01 | 6.58E+00 |
| | | 241.92 | | 7.46 | 8.93E-01 | | 3.05E+00 |
| | | 295.09 | | 19.20 | 8.91E-01 | | 1.03E+00 |
| | | 351.87 | | 37.10 | 9.28E-01 | | 6.81E-01 |
| | | 609.31 | | 46.10 | 2.70E-01 | | 6.64E-01 |
| | | 1120.27 | | 15.00 | 5.64E-02 | | 2.18E+00 |
| | | 1764.49 | | 15.90 | 2.43E+00 | | 3.01E+00 |
| | TH-232d | 238.58 | | 43.60 | 6.64E-01 | 5.04E-01 | 5.04E-01 |
| | | 338.42 | | 12.40 | 3.94E-01 | | 1.56E+00 |
| | | 583.02 | | 30.87 | 1.98E-01 | | 9.08E-01 |
| | | 911.16 | | 29.00 | 7.41E-01 | | 1.09E+00 |
| | | 968.97 | | 17.40 | 4.52E-01 | | 1.94E+00 |
| + | U-235 | 143.79 | | 10.50 | 9.11E-01 | 2.70E-01 | 1.21E+00 |
| | | 163.38 | | 4.70 | 7.44E-01 | | 2.79E+00 |
| | | 185.74 | * | 53.00 | 7.57E-01 | | 2.70E-01 |
| | | 205.33 | | 4.70 | 9.18E-01 | | 3.05E+00 |
| + | U-238d | 63.29 | * | 3.80 | 9.14E+00 | 2.37E+00 | 3.93E+00 |
| | | 92.56 | * | 5.41 | 9.97E+00 | | 2.37E+00 |
| | AM-241 | 59.54 | | 35.70 | 2.36E-02 | 2.87E-01 | 2.87E-01 |
| | CM-243 | 99.52 | | 14.40 | -1.95E-01 | 4.67E-01 | 7.37E-01 |
| | | 103.73 | | 23.00 | 2.13E-01 | | 4.67E-01 |
| | | 116.93 | | 8.32 | -1.59E+00 | | 1.23E+00 |
| | | 228.19 | | 10.56 | 2.38E-01 | | 1.44E+00 |
| | | 277.60 | | 14.00 | 6.80E-01 | | 1.21E+00 |
| | CM-245 | 99.52 | | 21.10 | -1.33E-01 | 3.20E-01 | 5.03E-01 |
| | | 103.73 | | 33.60 | 1.46E-01 | | 3.20E-01 |
| | | 116.93 | | 12.20 | -1.08E+00 | | 8.38E-01 |
| | | 174.94 | | 9.50 | -3.64E-01 | | 1.42E+00 |

Analysis Report for RCF19418

J16J44 SAF:RC-087 FF2/618-7 Burial Gound Soil

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Reviewed and Approved: **EDWARD S. WALLACE**

APR 08 2008 (print/sign/date)

Edward S Wallace

TESTAMERICA

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| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-087-0718 | Page 1 of 1 |
|---|---|---|---|
| Collector: B Lawrence, E. Harries | Company Contact: Joan Kessner; Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH | Price Code: 2A; Data Turnaround: 24 Hours |
| Project Designation: 618-7 Burial Ground - Soil | Sampling Location: 618-7 Burial Ground/Stockpiles | SAF No.: RC-087 | |
| Ice Chest No. | Field Logbook No.: EL-1395-12; COA: RG61872600 | Method of Shipment: GOVERNMENT VEHICLE | |
| Shipped To: Radiological Counting Facility | Offsite Property No.: NA | Bill of Lading/Air Bill No.: NA | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radiological and Beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | | | | | | | | | | |
| Type of Container | Snap Vial | | | | | | | | | | |
| No. of Container(s) | 1 | | | | | | | | | | |
| Volume | 80g | | | | | | | | | | |
| SAMPLE ANALYSIS | RCF GEA Shipping Screen | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | RCF | | | | | | |
| ~~J16J42~~ | ~~SOIL~~ | ~~4/4/08~~ | | | | | | | | | |
| J16J43 | SOIL | 4·4 08 | 0805 | X | 19417 | | | | | | |
| J16J44 | SOIL | 4·4·08 | 0810 | X | 19418 | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | SPECIAL INSTRUCTIONS | Matrix * |
|---|---|---|---|
| Relinquished By/Removed From: E. Harries / E. Harries; Date/Time: 4/4/08 0845 | Received By/Stored In: R. Fahlberg / R. Fahlberg; Date/Time: 0845 4·4·08 | None | S=Soil; SE=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; Liq=Liquid; Vg=Vegetation; X=Other |
| Relinquished By/Removed From: R. Fahlberg / R. Fahlberg; Date/Time: 0930 4·4·08 | Received By/Stored In: 4·4·08 Ref 1A Shipping facility; Date/Time: 0930 | | |
| Relinquished By/Removed From: LOCO/CA; Date/Time: 4/7/08 1000 | Received By/Stored In: M. Mahanbouch; Date/Time: 4/7/08 1000 | | |
| Relinquished By/Removed From: M. Mahanbouch; Date/Time: 4/7/08 1010 | Received By/Stored In: [illegible]; Date/Time: 4/7/08 1010 RCF | | |
| Relinquished By/Removed From; Date/Time | Received By/Stored In; Date/Time | | |
| Relinquished By/Removed From; Date/Time | Received By/Stored In; Date/Time | | |

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

RCF 19418

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# Sample Check-in List

Date/Time Received: 4908 0905 GM Screen Result 0.1K

Client: WCH SDG #: J001166 NA[ ] SAF #: RC-087 NA [ ]

Work Order Number: J8D090173 Chain of Custody # RC-087-0783

Shipping Container ID: _____ Air Bill # _____

1. Custody Seals on shipping container intact? NA [ ] Yes [✓] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [✓] No [ ]
3. Chain of Custody record present? NA [ ] Yes [✓] No [ ]
4. Cooler Temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 2
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ___ Tape
   - ✓ Custody Seals
   - ___ Hazard Lables
   - ✓ Appropriate Sample Lables
9. Samples are:
   - ✓ In Good Condition
   - ___ Broken
   - ___ Leaking
   - ___ Have Air Bubbles
   - (Only for samples requiring no head space.)
10. Sample pH taken? NA [✓] SOIL pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount $HNO_3$ Added _____
11. Sample Location, Sample Collector Listed? *
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: LJL Date: 4 9 08

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Client Informed on _____ by _____ Person Contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____